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Volume 31 October, 1948 No. 10

THE CLINICAL USE OF SODIUM FLUORESCEIN AND RADIOACTIVE DIIODOFLUORESCEIN IN THE LOCALIZATION OF TUMORS OF THE CENTRAL NERVOUS SYSTEM

GEORGE E. MOORE, M.D., WILLIAM T. PEYTON, M.D., SAMUEL W. HUNTER, M.D., and LYLE FRENCH, M.D.
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FLUORESCEIN (resorcinolphthalein), a non-toxic acid chromogen dye, was injected intravenously in animals by Erlich[4] in 1882 to study the formation of fluid in the anterior chamber of the eye. In 1912, Kafka[10] injected sodium fluorescein subcutaneously in animals and found that it did not stain the brain or spinal cord but did stain all other tissues including the dura and choroid plexus. Schonfeld,[20] in 1925, also investigated the appearance of sodium fluorescein in the spinal fluid and found that when large doses (6 to 8 grams) are given by mouth, it passes in small quantity into the spinal fluid in some normal individuals but more often in patients with syphilis. Subsequently, Jervell[9] and Bonar and Bailey,[1] have suggested that the appearance of sodium fluorescein in the spinal fluid be used in the diagnosis of meningitis.

That the luminescent property of intravenous fluorescein can be observed on the body surface when examined under ultraviolet light was demonstrated by Lange and Wollheim.[11] Since 1942 a number of reports have appeared in the literature concerning the use of intravenous fluorescein to measure circulation time (arm to tongue) and to evaluate the adequacy of the circulation in an extremity.[5,12,13,19,20,21]

Moore and Campbell,[14] at the University of Minnesota, modified the test for evaluation of peripheral vascular disorders of the extremities by injecting the dye into the artery of the extremity to be tested.

Intravenous sodium fluorescein has also been used to determine the patency of circulation to strangulated viscera.[12,15]

Beginning in October, 1946, Moore[16] began intravenous injection of 5 c.c. of sodium fluorescein in patients operated upon for carcinoma of the stomach, with the thought that the tumor tissue might be differentially stained. At first, the dye was injected when the abdomen had been opened, and no difference in fluorescence of the tumor and surrounding tissues under a Woods lamp was noted. However, as the interval between the time of the intravenous injection of dye and exposure and examination of the tumor was increased, it was found that there was, at times, a good differential fluorescence. The optimum interval between injection and inspection under ultraviolet light appeared to be approximately three hours. However, many of these tumors of the gastrointestinal tract, as well as those of the breast or others parts of the body, did not retain the dye in increased amount. But when sodium fluorescein was injected intravenously in patients with tumors of the central nervous system, they almost invariably showed differential fluorescence when exposed under a Woods light approximately three hours later.[16]

This technique has been quite helpful in locat-

Supported in part by grants from the National Cancer Institute, the Flora L. Rosenblatt Fund for Cancer Research, and the Graduate School of the University of Minnesota.
From the Department of Surgery, University of Minnesota Medical School, Minneapolis, Minnesota.
Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 8, 1948.
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ing subcortical brain tumors. In this clinic, it is the custom to avoid large openings in the dura when there is increased intracranial pressure, but after the tumor has been localized, a small opening is made directly over it, and all the tumor or a sufficient part of it is removed to release the dural tension. Then, if necessary, a more adequate opening in the dura is made. After making small openings for a brain needle at the suspected site, the needle is introduced and, with syringe, suction biopsies are obtained. These are examined under a Woods light in the operating room itself, and if they fluoresce it is immediately known that the tumor has been located.

It has been found convenient to have the room nurse hold the biopsy material under the Woods lamp so that the surgeon can examine the tissue and confirm the presence or absence of fluorescence without moving from his operating position. A faint fluorescence may be obtained from the edematous tissue in the immediate vicinity of the tumor but once this area is located it is not difficult by additional needle biopsies to determine the site of maximum fluorescence, which is found in the tumor. This procedure avoids the delay of waiting for microscopic sections where the needle biopsy cannot be grossly recognized as tumor; it checks all parts of the needle biopsy for tumor and thus enables the pathologist to make sections of only the more suggestive parts; and, finally, it may give a clue to the fact that one is in the vicinity of the tumor. This procedure has now been used in sixty-five cases, and in every case but one where the biopsy did fluoresce a tumor was proven to be present by microscopic examination. An absence of fluorescence is equally consistent.[17] Here also there was one case, an angiomatous meningioma, which did not fluoresce until it was washed free of blood.

The residual cavity remaining after the tumor has been removed can be inspected for tumor tissue by noting any unusually fluorescent areas. In several instances, infiltrating portions of tumor have been discovered by examination with the ultra violet lamp and subsequently removed, thus resulting in a more complete operation. Fluorescence does not differentiate the type of tumor, but in general more malignant lesions fluoresce most highly. In our experience, every kind of intracranial tumor exposed since we have used this method has shown fluorescence enough to distinguish the tumor from the surrounding brain tissue.

The reason for this differential fluorescence is not clear. That it is not due to greater vascularity is obvious from the fact that the maximum differential does not appear until some three hours after injection. That it is not entirely a disturbance in the so-called blood-brain-barrier would appear from the fact that some gastrointestinal and other tumors also show a similar differentiation. However, its consistency in tumors of the brain and spinal cord in contrast to its inconsistency elsewhere would suggest that the blood-brain-barrier was a most important factor.

Since the experiments of Goldmann,[8] many facts about the blood-brain-barrier have been discovered. Friedman and co-workers[6,7] have demonstrated that, as a rule, substances that are blocked by the barrier carry negative electrical charges. This is true for both dyes and toxins. Broman[2,3] appears to have demonstrated the barrier to be within the blood vessels (intima), because when he injected dye and then quickly washed it out, he found the vessels of the brain unstained, but elsewhere in the body they were stained. He also found the blood-brain-barrier more easily made permeable when noxious substances were applied to the intima by carotid injection than when applied from without by application of the injurious substance to the pia.

To what degree this differential staining of brain tumors after injection of sodium fluorescein is dependent upon a disturbance of the blood-brain-barrier by tumor will have to be determined by future investigation. We have not verified by biopsy any vascular lesion in man after injection of dye. Some experiments with vascular lesions and abscesses in animals are now in progress. One tuberculous granuloma of meninges exposed at operation did not fluoresce.

Since we have begun to use vital staining in brain surgery, reports by Sorsby et al[22] have come to our attention. They made a similar attempt to differentiate tumor tissues at operation by vital staining. They used Kiton green in a few cases, but with little success.

Since sodium fluorescein was so consistently taken up by tumors of the central nervous system, it seemed possible that by combining it with one of the heavier elements, or tagging it with a radioactive isotope, its clinical usefulness might be

extended as radio-opaque or radioactive substance.[18]

Diiodofluorescein and also tetraiodofluorescein were prepared and injected, but the differential opacity within brain tumors has not been sufficient to visualize tumors in roentgenograms.

Also, radioactive diiodofluorescein was prepared with iodine$_{131}$. Iodine$_{131}$ has the requisites of relatively rapid decay (half life eight days), and it has a penetrating gamma radiation which can be readily detected at a distance.

Approximately 1 mc. of iodine$_{131}$ is injected intravenously in the form of diiodofluorescein and two to four hours later counts are made over the head with a Geiger-Mueller counter. Differential staining with fluorescein was found to be best some two hours or more after injection of the dye, so also the counting rates do not reveal significant differences until a similar period has elapsed after injection of the dye.

Counts for two- to five-minute intervals are taken over various symmetrical areas of the skull, and the counting rates per minute for each area are compared for localization of the lesion.

The results obtained on twenty-six patients who were suspected of harboring brain tumors are available for evaluation of the procedure. Only those patients in whom a lesion was later demonstrated to be present or proven to be absent by operation, ventriculogram or angiogram are included.

Summary of the above twenty-six cases: eight tumors were correctly localized; two tumors were located close to but not exactly at the correct site; in six no focal lesions could be located and none was demonstrated by operation, ventriculogram or angiogram; seven tumors were incorrectly localized or missed; one tumor was localized only as to the proper hemisphere.

It is notable that three of the eight cases incorrectly located by Geiger counts were tumors of the posterior fossa where it would appear that the procedure is less accurate because there is a greater mass of tissue between the brain and Geiger-Mueller tube. This increases the distance and interposes tissue relatively high in radioactive iodine.

In nine cases another 0.1 mc. radioactive fluorescein was injected just before operation. During operation normal brain tissue and brain tumor tissue were removed, and beta ray counts were made from the surface of a piece of each equal in surface area and more than 3 mm. thick. These counts showed the tumor to contain from approximately two to twenty-nine times as much radiation as the brain tissue. But they probably are not as significant as they might be if it were always possible to obtain entirely satisfactory specimens for comparison. However, this has not been feasible. In some cases, at least, the brain tissue has been traumatized or deprived of its blood supply (which we have reason to believe causes it immediately to take up the dye). In some cases, a considerable time elapsed between the taking of the normal brain biopsy and the exposure of the tumor and removal of a portion of it for the test. Finally, the time interval after the injection of the dye to the taking of the specimens for estimation of radioactivity was not always best for maximal differentiation.

Discussion

The use of sodium fluorescein as an aid in the localization and diagnosis of brain tumors at operation is a simple and accurate technique. The method utilizes no special apparatus except a mercury vapor lamp, which can be obtained from one of several commercial concerns. It therefore can be carried out at any hospital in which neurosurgery is done.

The use of radiopaque dyes to outline tumors of the central nervous system has not been successful. However, calculations based upon phantom experiments indicate the feasibility of the method, if the proper dyes can be synthesized.

The clinical value of the use of radioactive dyes to detect brain tumors preoperatively is yet to be determined. Some of the limitations of the method are already known. "Benign" tumors, such as acoustic neuroma, fibrous meningiomas, and certain astrocytomas, do not take up enough dye to give a differential ratio of radiation large enough to be detected by the Geiger-Mueller counter. There is also a limit as to the size of tumor that can be detected. Tumors with a diameter of less than 3 cm. cannot be detected unless surrounded by an appreciable area of edema. It is hoped that improvements in the physical apparatus itself will result in greater accuracy.

It should be pointed out that radioactive diiodofluorescein cannot be used for therapy. The dye is concentrated and excreted largely by the

liver, and therefore irreparable damage would be incurred by the liver before the comparatively radioresistent brain tumors received a carcinolytic dosage.

Conclusion

Differential staining which makes it possible immediately to recognize even minute particles of tumor in biopsies has proven to be very valuable in locating subcortical tumors by needle biopsy, and it can be used to identify remaining fractions of tumor, but only when these are entirely free from overlying hemorrhage.

The localization of tumors by Geiger count is still uncertain. Our experience with this method is quite small, and we have not yet come to rely upon it for operation on otherwise unlocalized tumors. Improvements in apparatus and technique should make it more reliable.

Bibliography

1. Bonar, B. E., and Bailey, L. G.: The diagnostic value of sodium fluorescein in epidemic cerebrospinal meningitis. Am. Dis. Child., 40:493, 1930.
2. Broman, T.: The possibilities of the passage of substances from the blood to the central nervous system. Acta. Psychiat. et Neurol., 16:1, 1941.
3. Broman, T.: Acta. Med. Scand., 118:79, 1944.
4. Erlich, P.: Ueber Provocirte Fluorescenzercheinungren am Auge. Deutsch Med. Wchnschr., 8:35, 1882.
5. Fishback, D. B., Guttman, S. A., and Abramson, E. B.: An objective method of determining blood velocity (fluorescein method). Am. J. M. Sc., 203:535, 1942.
6. Friedman, U., and Ekkles.: The blood-brain-barrier in infectious diseases. Lancet, 226:719 and 775, 1934.
7. Friedman, U.: Further investigation on the blood-brain-barrier. J. Immunol., 32:97, 1936.
8. Goldmann: Experimentelle untersuchungen uber die Function der plex. choroid. und der Hirnhaute. Arch. f. klin. Chir., 101:735, 1931.
9. Jervell, O.: The permeability of meninges to uranin as a method in the diagnosis of meningitis. Brit. M. J., 1:210, 1925.
10. Kafka, V.: Untersuchungen zur Frage der Entstehung, Zirculation and Function der Cerbrospinalflussigkeit. Zeitschr. f.d. ges. Neurol. u. Psychiat., 13:1921, 1912.
11. Lange, K., and Wollheim, E.: Die Kreislaufszeit und ihr Beziehung zu anderen Kreislaufsgrossen. Deutsch Geselsch. f. Innere Med., 43 Congress. p. 134, 1931.
12. Lange, K., and Boyd, L. J.: The use of fluorescein to determine the adequacy of the circulation. M. Clin. N. A., 26: 943, 1942.
13. Lange, K., and Boyd, L. J.: Use of fluorescein method in establishment of diagnosis and prognosis of peripheral vascular diseases. Arch. Int. Med., 74:175, 1944.
14. Moore, G. E., and Campbell, G. S.: Intra-arterial fluorescein for evaluation of peripheral vascular disease. Proc. Soc. Exp. Biol. & Med., 65:297, 1947.
15. Moore, G. E.: Unpublished data.
16. Moore, G. E.: Fluorescein as an agent in the differentiation of normal and malignant tissue. Science, 406:131, 1947.
17. Moore, G. E., Peyton, W. T., French, L. A., Walker, W. W.: The clinical use of fluorescein in neurosurgery; the localization of brain tumors. J. Neurosurg., (July) 1948.
18. Moore, G. E.: The use of radioactive diiodofluorescein in diagnosis and localization of brain tumors. Science, 107:569, 1948.
19. Neller, J. L., and Schmidt, E. R.: Wheal fluorescence. Ann. Surg., 121:328, 1945.
20. Neller, J. L.: The use of fluorescent wheals in determining extent and degree of peripheral vascular insufficiency. Ann. Surg., 122:898, 1945.
21. Sicher, W. D.: Circulation time of the extremities using intravenous administration of fluorescein. Staff Meet. Mayo Clinic, 18:515, 1943.
22. Sorsby, A., Wright, A. D., and Elkeles, A.: Vital staining in brain surgery. Proc. Roy. Soc. Med., 36:137, 1942.
23. Schonfeld, W.: Versuche am Lebenden uber den ubergang von Farbstoffen aus dem Blut in die Ruchenmarksflussigkeit. Arch. f. Dem. u. Syphilis, 132:162, 1921.

IS VET PROGRAM NUDGING US INTO SOCIAL MEDICINE?

A medical man who occasionally communicates his ideas to this department wonders if we may not be backing into socialized medicine through the government program of care for veterans. It's a touchy subject, he admits, but it is going to be increasingly difficult to keep under cover in the next few years. More than 80 per cent of the beds in veterans' hospitals in this area, our correspondent reports from personal check, are occupied by veterans whose disabilities can't be traced to their service in the armed forces.

As the law now stands, a veteran may go to a government hospital at any time for medical treatment or surgery. He is required to make a statement that he can't afford private medical care. But this requirement has become largely a matter of form, and the signer rarely is questioned as to his financial ability.

Demand for free service is so great that the veterans' medical program alone is costing the government currently some $400,000,000 a year. What it will cost when the majority of World War II vets arrive at the age when illness is to be expected can only be guessed. If we extend the same privilege to the new draftees, the total cost a decade hence could easily be in excess of two billions a year.

According to Veterans Administration figures, $5,000,000,000 has been spent on education and on-the-job training benefits since the GI bill was enacted in 1944. Another $3,000,000,000 has been paid to veterans as unemployment or self-employment allowances. Business, farm and housing loans now total $223,000,000.

Costly as this program has been, few Americans would have it otherwise. Moreover, the underlying premise all along has been that after the veteran is readjusted he will be a self-sufficient citizen, or at least as much so as the rest of us in this day and age. On the other hand, free medical service for life to millions of men who left the armed forces in good physical condition is stretching government's responsibility out of all semblance to reason. (The Round Table by W. J. Brons, *Chicago Journal of Commerce*, July 20, 1948).

MULTIPLE CARCINOMAS OF THE STOMACH AND CHOLEDOCHOLITHIASIS IN A PATIENT WITH PERNICIOUS ANEMIA

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STATISTICALLY, carcinoma of the stomach is the cause of more deaths than any other malignant disease. It is said that in the United States alone, more than 50,000 persons die annually from this cause.

The incidence of simultaneous multiple malignancies is small. In reports of large series of cases from different centers it varies from 3.34 to 4.7 per cent. Of 1,048 cases of multiple malignant lesions, reported by Warren and Gates, there were thirty-six cases of multiple carcinoma of the stomach, an incidence of 3.4 per cent. Brindley, Dockerty and Gray reported that in 1,184 cases of carcinoma of the stomach there were twenty-three (1.94 per cent) of multiple gastric carcinomas. In a recent study of eighty patients with intraoral epidermoid carcinoma, Slaughter found that 18 per cent had multiple independent primary tumors. Malignancies occurring in certain situations are more commonly multiple than those occurring in other organs. For example, Dockerty reminds us that papillary carcinoma of the ovary is bilateral in approximately 50 per cent of the cases and polypoid carcinoma of the colon presents multiple lesions in almost 40 per cent.

As previously indicated, multiple malignant lesions of the stomach are more rare. In February, 1946, Rickles reported a case with five primary cancerous lesions of the stomach, and he stated that in 1921 Owen reported a case with four primary malignancies of the stomach. In the case reported by Brindley, Dockerty and Gray there were four lesions in the stomach also.

In the case to be reported there were three distinct adenocarcinomas of the stomach. This case is of further interest in that the patient had pernicious anemia.

Case Report

A lawyer, aged sixty-one, was first seen in consultation with Dr. L. J. Kaasa on April 12, 1941. He complained of severe right upper quadrant abdominal pain associated with nausea and vomiting. He stated that about a year prior to that time he was jaundiced but had no pain. Since that time there had been several episodes of jaundice and some epigastric discomfort but no severe pain until March, 1941, when there was a severe attack of pain, a violent chill and subsequent jaundice. This pain did not radiate and was relieved by hypodermic administration of morphine sulphate. The present attack of pain was the most severe of any. The urine was colored and the patient had noticed that his skin was yellow.

Physical examination revealed a slender, tall, wiry, well-developed, well-preserved man. He was markedly jaundiced. Temperature was 99° F. The blood pressure 95 systolic and 65 diastolic. The abdomen was flat; the liver edge was palpable two fingers breadth below the costal margin, and it was tender. There was no rigidity, spasm or pronounced tenderness. Examination was otherwise essentially negative.

The patient stated that in 1930 a diagnosis of pernicious anemia was made at the Mayo Clinic. He remained at the clinic for ten weeks under treatment and since that time had taken liver irregularly. He had made it a practice to eat liver once a week, however, and when he felt that he was somewhat run down, he would report to his doctor for an injection of liver.

The family history was interesting in that the patient's mother died at the age of eighty-one years and his father died at the age of sixty-three years of Bright's disease.

After proper preparation, operation was performed. The gall bladder was found to be large, distended, subacutely inflamed and filled with stones. It was removed. The common duct was dilated to about three times its normal size, and a stone which measured 2 cm. in diameter was removed from the common duct. No other stones were found. A T-tube was placed in the common duct and the abdomen closed.

A choledochogram revealed great dilatation of the biliary tree but there was no deformity suggesting stones, and the dye entered the duodenum promptly. The patient insisted that the T-tube be removed. This was done about ten weeks following the operation, and the stab wound healed very promptly.

The patient was next seen in June, 1942. He stated that in May, 1942, he began to have some epigastric pain accompanied by nausea, vomiting, chills, fever and followed by jaundice. Since that time he had had two similar attacks.

Physical examination revealed essentially no change. The patient was markedly icteric. The heart and lungs were normal. The blood pressure was 105 systolic and 60 diastolic. There was some weakness in the upper right rectus scar and there was mild epigastric tenderness.

Laboratory examination revealed the urine to contain bile, but it was otherwise normal. The icterus

Read at the meeting of the staff of Naeve Hospital, Albert Lea, Minnesota, October 13, 1947.

index was 81. The erythrocytes numbered 3,620,000, the hemoglobin was 88 per cent (Dare), the leukocytes 37,000. The color index was 1.2. Examination of the blood smear revealed some anisocytosis and macrocytosis. Gastric analysis revealed the absence of free hydrochloric acid and a total acidity of 4 degrees.

Fig. 1. Photograph of portion of stomach removed. There are three distinct adenocarcinomas.

The patient entered the hospital on August 30, 1942, after having had two more attacks of pain, nausea, vomiting, jaundice. There was no change of findings on physical examination.

Operation was performed on August 31, 1942. The abdomen was entered through the old upper right rectus scar. Exploration revealed a large carcinomatous lesion on the anterior wall of the stomach, the smaller lesion on the posterior wall of the stomach, and involvement of the glands in the gastrocolic omentum. No other evidence of extension was found. The common duct was enormously dilated so that it was at least an inch in diameter. It contained a large stone which was easily movable in the duct.

The common duct was incised and a stone measuring 2 cm. in diameter was removed. The duct was then thoroughly explored with scoops and no other stones found. A T-tube was sutured in the common duct.

The duodenum was mobilized and sectioned. The stump was inverted with two rows of sutures and buried in the head of the pancreas. About four-fifths of the stomach was removed, together with the gastrocolic omentum. A posterior Polya anastomosis was effected. Sulfanilamide powder was placed in the abdominal cavity and the wound closed in layers. The T-tube and two Penrose drains were brought out through a stab wound. A transfusion of 1,000 c.c. of whole blood was given during the operation.

The operative specimen consisted of a portion of stomach which measured 15 cm. along the lesser curvature and 24 cm. on the greater curvature. On the anterior wall there was an ulcerating lesion measuring 7 cm. in diameter, and on the posterior wall there was an ulcerating lesion measuring 3 cm. in diameter. Higher on the anterior wall there was a nodule which measured 2 cm. in diameter. One gland in the gastrocolic ligament was found to be involved. Microscopic examination of the four areas revealed them to be adenocarcinoma, Grade 4.

Convalescence was uncomplicated and the patient was dismissed from the hospital on September 20.

Choledochograms made on October 8, November 2, and December 21, 1942, revealed a dilated common bile duct but no evidence of deformity or stones. The dye entered the duodenum promptly and also made its appearance in the jejunum and in the stomach. On December 21 the T-tube was removed. The patient enjoyed good health for more than a year. During the author's absence in military service, the patient was examined elsewhere, and no evidence of metastasis or recurrence was found. During the latter part of 1943 he began to lose his appetite and began to lose weight. On January 24, 1944, he re-entered the hospital. Physical examination was essentially negative except for severe malnutrition. The urinalysis was negative. Hemoglobin was 95 per cent, and the leukocytes numbered 5,200. Occult blood was present in the stools. The patient failed gradually and died on February 23, 1944. Autopsy was not performed.

It is now generally accepted that in a large proportion of the cases of cancer of the stomach, achlorhydria is present, and that there is also a diminished volume of gastric secretion. The first communication concerning a derangement of gastric secretion associated with cancer of the stomach is attributed to Bird, who in 1842 drew attention to the lack of acid or to the small quantity of free acid in the vomitus of patients with gastric cancer. This observation stimulated further study.

Why is achlorhydria associated with cancer of the stomach? It has been suggested that the presence of the cancer interferes with the secretion, and others maintain that the carcinoma develops in a gastric mucous membrane which has been previously deranged. The evidence at hand seems to indicate that cancer of the stomach is prone to occur in those organs in which there have been chronic inflammatory changes, such as in a chronic atrophic gastritis. In pathologic studies of the gastric mucosa in stomachs affected by carcinoma, Judd, Orator, and others have found evidence of a diffuse, atrophic gastritis. To quote Rhoads, "It seems fair to assume that in certain instances gastritis is associated with cancer and, from the evidence previously discussed, that it precedes the neoplasm."

Pernicious anemia is recognized as a disease of the hematologic system characterized by pallor, weakness, anemia, macrocytosis, glossitis, and neurologic findings. The gastric mucosa is also invariably affected. According to Olson and Heck, Fenwick in 1877 first described the pathologic changes in the stomach associated with pernicious anemia. More recent studies by Brown, in the Boston City Hospital, and others, have firmly established the invariable association of gastritis with pernicious anemia.

Since gastritis is constantly associated with pernicious anemia and because of the frequent association of gastritis with carcinoma of the stomach, it seemed logical to think of gastritis as a possible etiological factor in the production of gastric cancer. Quincke first described a case of cancer of the stomach associated with pernicious anemia in 1876. Since that time many reports have appeared attesting to the high incidence of gastric neoplasm in individuals with pernicious anemia. Jenner, of Amsterdam, studied 181 cases of pernicious anemia and came to the conclusion that "there is vast difference in the incidence of carcinoma of the stomach in individuals with pernicious anemia and in the non-pernicious-anemia portion of the population." Cotti studied 107 patients with neoplasms associated with pernicious anemia and found that ninety-three (86 per cent) of the tumors were located in the stomach. Brown, in Boston, in 151 autopsies on patients dying with pernicious anemia, found that 8 per cent of the stomachs contained benign gastric tumors, neoplasms recognized as being precancerous. Schleicher, Sommers, and Ikeda have stated that about 10 per cent of their pernicious anemia patients develop carcinoma of the gastrointestinal tract. Rigler and Fink, in two large groups of cases of pernicious anemia, found the incidence of tumors of the stomach to be 7.8 per cent.

The conclusions of many clinicans, pathologists, and radiologists have been well summarized by Rigler and Fink and are as follows:

1. There is a distinct relationship between cancer of the stomach and pernicious anemia which is more than coincidental.

2. This relationship may well be on the basis of atrophic gastritis which is a predisposing factor to both diseases.

3. Carcinoma of the stomach should be suspected in patients with pernicious anemia if the slightest gastric symptoms are exhibited.

4. A routine radiographic examination of the gastro-intestinal tract of patients with pernicious anemia should be conducted semi-annually and has been found to be a fruitful procedure.

In summary, a patient with multiple carcinomas of the stomach, a rare condition, has been presented. The presence of a common duct stone was coincidental. This patient had well-established pernicious anemia of twelve years' duration.

References

1. Bird, Golding: Contributions to the chemical pathology of some forms of morbid digestion. London W. Gaz., 2:391, 1841-42.
2. Bourne, W. A.: Cancer of the stomach in patients with pernicious anemia. Brit. M. J., (Jan. 17) 1948.
3. Brindley, G. V.; Dockerty, M. B., and Gray, H. K.: Multiple carcinomas of the stomach: report of case. Proc. Staff Meet. Mayo Clin., 18:193-199, (June 30) 1943.
4. Brown, Madelaine R.: Pathology of the gastrointestinal tract in pernicious anemia and subacute combined degeneration of spinal cord: study of 151 autopsies. New England J. Med., 210:473, 1934.
5. Conner, H. M., and Birkeland, I. W.: Coexistence of pernicious anemia and lesions of the gastrointestinal tract. Ann. Int. Med., 7:89-104. (July) 1933.
6. Cotti, L.: Quoted by Rhoads.[18]
7. Doehring, P. C., and Eusterman, G. B.: Association of pernicious anemia and carcinoma of the stomach. Arch. Surg., 45:554-563, (Oct.) 1942.
8. Haggard, C. E.: Pernicious anemia and cancer of the stomach. Northwest Med., 40:125-127, (April) 1941.
9. Held, I. W., and Goldbloom, A. A.: Carcinoma of stomach in a cured case of Addison-Biermer's (pernicious) anemia. J.A.M.A., 108:1389-1400, (April 24) 1937.
10. Judd, E. S., Jr.: Thesis presented to University of Minnesota.
11. Lawrence, E. A., and Kay, J. H.: Carcinoma of stomach. Surgery, 19:504-514, (April) 1946.
12. Lichtman, A. L.: Multiple primary malignant lesions. Proc. Staff Meet. Mayo Clinic, 19:316-323, (June 14) 1944.
13. Nesler, A. B.: Carcinoma of stomach associated with pernicious anemia. J. Iowa State M. Soc., 30:410-411, (Aug.) 1940.
14. Olson, S. W., and Heck, F. J.: Lesions of the gastric mucosa in pernicious anemia. Proc. Staff Meet. Mayo Clin., 20:74-78, (March 7) 1945.
15. Orator, V.: Beitrage zur Magenpathologie. II. Sur Pathologie und Genese des Carcinoma and Ulcercarcinoms des Magens. Virchows Arch. f. path. Anat., 256:204, 1925.
16. Rhoads, C. P.: Gastric cancer as a sequel to gastritis, particularly the gastritis of pernicious anemia. J. Nat. Cancer Inst., 1:511-522, (Feb.) 1941.
17. Rickles, J. A.: Multiple carcinomas of the stomach. Surgery, 19:229-236, (Feb.) 1946.
18. Rigler, L. G., and Fink, D. L.: Pernicious anemia and carninoma of the stomach. Staff Meet. Bull., Hosp. Univ. Minnesota, 14:112-123, (Dec. 4) 1942.
19. Schleicher, E. M.; Sommers, Ben, and Ikeda, K.: Pernicious anemia. Minnesota Med., 28:818-819, (Oct.) 1945.
20. Silverman, S.: Pernicious anemia followed by carcinoma of the stomach. Lancet, 2:71-74, (July 11) 1936.
21. Slaughter, D. P.: Multicentric origin of intraoral carcinoma. Surgery, 20:133-146, (July) 1946.
22. Warren, S., and Gates, O.: Multiple primary malignant tumors; a survey of the literature and a statistical study. Am. J. Cancer, 16:1358-1414, (Nov.) 1932.
23. Washburn, R. N., and Rozendaal, H. M.: Gastric lesions associated with pernicious anemia. Ann. Int. Med., 11:2172-2180, (June) 1938.
24. White, R. R., and Walters, W.: Simultaneous carcinoma and tuberculosis of the stomach in a case of pernicious anemia. Proc. Staff Meet. Mayo Clin., 18:165-172, (June 2) 1943.

GASTRIC CARCINOMA: ITS ETIOLOGY, SYMPTOMS AND TREATMENT

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ONE of the penalties that we as a nation pay for an increased span of life is that more of us reach the "cancer" age. Statisticians tell us that by 1960 approximately 40 per cent of our population will be over forty-five years of age, and accordingly the annual death toll from carcinoma will be approximately 270,000.[7] In a recent article Sir Heneage Ogilvie[17] states that in England, cancer is the most frequent cause of death in men and women over the age of forty, while in this country, cancer stands next to cardiovascular disease as the chief cause of death in both males and females.

The problem of gastric cancer takes on enhanced significance in view of the above facts. Of all forms of cancer, gastric cancer is responsible for most deaths in males, and ranks second to carcinoma of the uterus as a cause of deaths in females. It is estimated that approximately 40,000 people will die from gastric carcinoma annually.[14] There can be no doubt that gastric carcinoma is a trying and grave issue that must be solved if any significant reduction in the number of "cancer deaths" is to become apparent.

Etiology of Gastric Cancer

The cause or causes of gastric cancer in man remain unknown. In pursuit of the problem of causation of gastric carcinoma, much valuable information has been uncovered. It is questionable whether gastric carcinoma ever arises on a perfectly normal gastric mucosa. Konjetzny[12] strongly maintained that chronic gastritis, particularly of the atrophic type, precedes all gastric carcinomas. However, the exact significance of gastritis, both as a clinical and pathological entity, is a sorely debated point. The careful studies of Hebbel[9] indicate that chronic gastritis occurs as commonly in people past middle life without accompanying gastric cancer, as in those with gastric malignancy.

Rigler and co-workers[11,18,20] have emphasized the frequent association of gastric carcinoma and pernicious anemia. They point out that gastric cancer is approximately ten times more frequent in patients with pernicious anemia than in the rest of the population. Magnus and Ungley[15] in this connection have described the marked atrophy of the stomach in pernicious anemia patients which, however, may disappear with adequate liver therapy. Despite the disappearance of the atrophic changes following liver therapy, some of these patients eventually develop gastric carcinoma.[8] Rodgers and Jones[21] noted the presence of superficial hemorrhagic erosions and ulcers on gastroscopic examination of patients with atrophic gastritis and idiopathic achlorhydria. These observations are of extreme importance, for the fate of these gastric erosions and ulcers should be followed carefully to see if any eventually become converted into carcinoma.

Achlorhydria and hypochlorhydria (less than 30° free acid) have long been known to accompany gastric cancer. The data of Hebbel and Gaviser[10] of our hospital reveal that 75 per cent of patients with gastric carcinoma are achlorhydric and an additional 18 per cent are hypochlorhydric after histamine stimulation. Whether achlorhydria and hypochlorhydria appear only after the gastric malignancy has developed, or whether achlorhydria and hypochlorhydria are present prior to the development of gastric carcinoma, has been answered in part by Comfort and co-workers[4] who have followed a large number of achlorhydric patients and have found that carcinoma is more likely to develop in this group than in patients who have normal gastric acidities.

Polyps of the stomach have also been indicted as precursors of gastric carcinoma by a number of authors (Borrmann,[2] Schindler,[23] Rigler and Fink[19]). Spriggs and Marxer,[24] however, after careful study of a number of patients with gastric polyp, point out that it is difficult to evaluate the actual fate of a gastric polyp in any given instance. In our clinic we have observed one patient, after a subtotal gastric resection for a benign polyp of the stomach, who returned four years later with an inoperable carcinoma arising from the residual pouch.

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The relationship between gastric ulcer and gastric carcinoma is a disputed one. That malignant transformation of a gastric ulcer may occur is denied by no one, but there is considerable debate concerning the incidence of this transformation. McCarty[16] of the Mayo Clinic reports the frequent presence of malignant degeneration in gastric ulcers—a finding which he has not observed in duodenal ulcers. Most pathologists[3] feel, however, that the incidence of malignant degeneration of a benign gastric ulcer is approximately 3 to 5 per cent. Very frequently, painstaking examination of multiple sections of an ulcer must be done before a focal area of malignancy is uncovered. The problem of mistaking a gastric carcinoma for a benign ulcer, or vice versa, is a more pressing one. Particularly so is this for ulcers occurring in the prepyloric area. Sampson and Sosman[22] have found that approximately 75 per cent of prepyloric ulcers are malignant. The roentgenologist must bear in mind the importance of his interpretations in regard to gastric ulcer and carcinoma. He should make it clearly understood that in many instances it is impossible to differentiate between the two and if his report includes "gastric carcinoma cannot be ruled out," he will do a great deal towards preventing an unnecessary delay in the treatment of the patient.

The role played by heredity in the genesis of gastric carcinoma is not well understood. Data obtained[20] from family histories of patients with carcinoma of the stomach (Tables I and II) indicate that gastric cancer occurs more frequently in relatives of patients with gastric carcinoma than in relatives of patients treated at the University Hospitals for noncancerous gall-bladder disease, carcinoma of the colon and rectum, hemorrhoids and hernia. This difference is slight and, when subjected to statistical analysis, it is not significant. If further study reveals that these small differences continue to appear consistently in the series to be studied, they may be of some significance, although it must be borne in mind that patients with cancer of the stomach are probably more likely to be aware of the same disease in other members of the family than would patients who do not have gastric carcinoma. Denk[6] has also shown that gastric cancer appears to be more frequent in the relatives of patients with gastric cancer than in relatives of individuals of similar age groups not having gastric carcinoma. Age and sex play unexplained determinant roles apparently in the genesis of gastric cancer. From 85 to 95 per cent of gastric carcinoma occurs after the age of forty. The proportion of males to females is approximately three to two.[1]

TABLE I. INCIDENCE OF CANCER IN FAMILIES OF PATIENTS WITH GASTRIC CANCER

	Number of Families	Incomplete Information	Number of Families with Carcinoma of the Stomach	Number of Families with Carcinoma Elsewhere
Carcinoma of Stomach	200	13	29 (15.6%) (36 individuals)	30 (16%) (43 individuals)
Gall-bladder Disease (noncancerous)	200	12	20 (10%) (22 individuals)	31 (16%) (39 individuals)
Carcinoma of Colon and Rectum	200	31	16 (9.4%) (19 individuals)	36 (21.3%) (64 individuals) 8% with ca. of colon
Hemorrhoids	200	13	22 (12%) (24 individuals)	33 (17.6%) (39 individuals)

TABLE II

	Number of Relatives		Number of Relatives with Carcinoma of the Stomach
	Under 45	Over 45	(% Relatives Over 45)
Carcinoma of the Stomach	888	827	16 (1.90%)
Gall-bladder Disease	318	337	3 (0.89%)
Hernia	467	281	2 (0.79%)

Diagnosis of Gastric Cancer

The usual textbook picture of severe weight loss, anorexia, hematemesis, and persistent epigastric pain depicts the late stages of the disease. It cannot be overemphasized or repeated too often, that carcinoma of the stomach in the early stages is a *silent* disease. A celebrated American radi-

ologist and two famous surgeons, who did so much to emphasize means of diagnosis and treatment of gastric malignancy, died of gastric cancer, and in each instance the diagnosis was made at a late stage by the accidental discovery of an epigastric mass. These individuals who were so well aware of the possibility of development of gastric carcinoma in others were lulled into a false state of security because they had no symptoms. Little good and, in fact, serious harm results from perpetuating the teachings that well-defined symptoms are associated with gastric carcinoma. To emphasize that the symptoms may be vague and readily overlooked in the early stages of the disease rectifies the instructions only partly. Until the fact that complete and utter lack of symptoms is characteristic of early gastric cancer is driven home to the medical profession and the "lay public," little improvement is to be expected in the end results of the present mode of therapy in cancer of the stomach.

Exactly how long gastric cancer may remain silent is not known, but from experience obtained in cases where subtotal gastric resections have been done and where malignant cells have been left in the proximal line of resection, it appears that carcinoma of the stomach is a slow-growing lesion. These patients have been free of symptoms after operation, even though viable tumor cells have been left in the residual gastric pouch, for approximately eighteen months. It is thus apparent that if *early* diagnosis of cancer of the stomach is to be made, then patients who harbor the disease and who are completely asymptomatic must be uncovered. Such a study to determine patients who might develop gastric carcinoma, or who already had it but in the early asymptomatic stage, was undertaken in this clinic in July of 1945.[26]

TABLE III. INCIDENCE OF ACHLORHYDRIA AND HYPOCHLORHYDRIA IN PATIENTS OF AGE GROUPS ELIGIBLE FOR PRECURSOR GASTRIC CANCER STUDY

No.	Gastric Expression	Achlorhydrics (Histamine)			Hypochlorhydrics
		Triple G. I. Series	Double G. I. Series	Single G. I. Series	No. G. I. Series
Out-Patient Registrations 3805	2118 (1292 male) (826 female)	370 527 (241 male) (129 female)	153 154 (83 male) (70 female)	180 141 (102 male) (78 female)	54 34 (33 male) (21 female)

TABLE IV. RESULTS OF GASTROINTESTINAL SERIES IN PRECURSOR GROUPS

Precursor Groups	Number of Gastrointestinal Series	Findings	
		Polyps of Stomach	Carcinoma of Stomach
Achlorhydrics	936	29	3*
Hypochlorhydrics	34		
Pernicious Anemia	113	4	2
Relatives of patients with Gastric Cancer	43		
Patients with Occult Blood in the feces	64		
Patients with hemoglobin level of 11.0 grams or less	28		
Total	1218	33	5

*2 additional carcinomas missed through organizational errors.

The following groups were subjected to gastric roentgenograms at six-month intervals: (a) patients over the age of fifty* and free of digestive complaints, with achlorhydria and hypochlorhydria (less than 30° free acid) after histamine stimulation; (b) patients with gastric polyps; (c) patients with pernicious anemia; (d) patients with an unexplained hemoglobin level of 11.0 grams or lower; (e) patients with occult blood in the stool; and (f) relatives of patients with gastric carcinoma.

The results of this study from July 1, 1945, to October 1, 1947, are summarized in Tables III and IV.

The need for developing some workable plan for filtering off those cases most likely to harbor a gastric malignancy was additionally substantiated by the studies of St. John, Swenson, and Harvey,[27] and of Dailey and Miller.[5] The former investigators subjected 2,413 patients over the age of fifty, without gastric complaints, to a brief fluoroscopic examination of the stomach after the ingestion of barium. In this group of patients, two silent gastric cancers and one lymphosarcoma were found, an incidence of unsuspected gastric malignancy of 1.24 per thousand

*Prior to January 1, 1946, the age level for male patients was fifty-five years, and for female patients, sixty-five years.

patients. No gastric polyps were encountered by the Columbia group. Dailey and Miller reported a series of 500 patients subjected to barium examinations of the stomach. These examinations were performed on presumably normal men over the age of forty-five years, free from digestive complaints. Three gastric lesions were found: a benign gastric ulcer, a polyp, and antral gastritis in a third patient. In our study, limiting gastric roentgenograms to the above listed "precursor" groups, an effective filter has been interposed. For, of the 1218 roentgenograms in 752 individuals, five unsuspected gastric carcinomas and thirty-three gastric polyps have been found. The yield from such a study can be expected to increase with time, for it is our belief that a number of these patients who do not have gastric carcinoma at the time of the first examination may well develop this lesion, which will be found when repeat examinations at six-month intervals are done.

The results of this pilot study have been encouraging, and until some simple biological test for cancer becomes available, we feel that the regular examination at six-month intervals of apparently well individuals over the age of forty-five, such as could be accomplished at a cancer detection center, will uncover many early gastric cancers as well as early carcinomas and precancerous lesions of other organs.

Therapy of Gastric Carcinoma

The only effective mode of therapy available at present is gastric resection. If there has been any encouraging progress made in the problem of gastric carcinoma in the last twenty-five years, it has been in the field of operative attack. Through better preoperative preparation of patients, better anesthesia, adequate and timely replacement of blood loss at operation, the advent of antibiotics (particularly penicillin), and a better understanding of the postoperative fluid requirements of the patients, gastric resection is being accomplished successfully in many more patients than formerly.

At this clinic partial gastric resection is done through a left subcostal incision. Care is taken to remove the gastrocolic ligament, the greater omentum, and particularly the gastrohepatic ligament. The entire lesser curvature portion as well as the lymph nodes at the origin of the left gastric artery are excised. Wide removal of the stomach beyond the visible and palpable limits of the carcinoma is carried out, for there may be submucosal spread of a carcinoma for long distances beyond the confines of the tumor. Frozen sections and microscopic examination of the tissues of the proximal and distal lines of resection are done to determine if the surgeon is beyond the carcinoma. A 6 cm. aseptic "one-row" anastomosis between the gastric pouch and first portion of the jejunum or third portion of the duodenum, using interrupted silk sutures as described by Wangensteen,[28] is then accomplished. The ever-increasing aggressive attitude of the surgeons at this clinic has resulted in an increasing number of gastric resections with simultaneous excision of adjacent viscera (pancreas, colon, mesocolon, spleen, diaphragm, kidney, et cetera) as well as an increasing number of total gastric resections accomplished either through an abdominal or combined abdomino-thoracic approach.

TABLE V. OPERATIVE PROCEDURE AND OPERATIVE MORTALITY IN GASTRIC CARCINOMA

	Number of Patients	Per Cent of Total	Operative Mortality %
Patients with No Operations	138	23.7	
Laparotomy only	85	14.5	8.2
Palliative Procedures			
(a) Gastric Enterostomy	25	4.3	24.0
(b) Enterostomy	30	5.1	13.4
Resections			
(a) Partial	276	47.1	15.2
(b) Total	31	5.1	30.0
(c) All type	307	52.2	16.6
Total Operations	447	76.3	17.9

Recently the results of surgical therapy in gastric carcinoma at the University of Minnesota Hospitals over a ten-year period (1936 to 1945) have been reviewed.[25] The total number of patients in this group seen at the University of Minnesota Hospitals over the ten-year period was 586. Of these, 432 were men and 154 women. The average age of the patients was 63.2 years. Of this group, nineteen patients were in the terminal stages of their disease when first seen, so that surgical therapy was not feasible, but they are included for statistical purposes. Four hundred and forty-seven patients were operated upon, an operability rate of 76.3 per cent (Table V). In this group of 447 patients, eighty-five (14.5 per cent) had laparotomies only, twenty-five (4.3 per cent) had gastrojejunostomies, and thirty (5.1 per cent) had enterostomies. Three hundred and seven patients

TABLE VI. CAUSES OF DEATH FOLLOWING GASTRECTOMY (ALL TYPES)*

Peritonitis	28
Pulmonary Complication	8
Cardiac Failures	4
Renal Complications	3
Pulmonary Embolism	2
Cerebrovascular Accident	1
Shock	1
Undetermined	4
Total	51

*Forty-four autopsies obtained.

underwent gastric resection, a resectability rate of 52.2 per cent. In this group there were thirty-one total gastric resections and 276 partial resections. The resectability rate based on the total number of patients studied was 52.2 per cent, but when determined on the basis of those subjected to laparotomy (447), it was 68 per cent.

Postoperative Mortality

Among the patients with gastric resection (307) there were fifty-one deaths, a mortality rate of 16.6 per cent (Table V). There were 276 partial gastric resections with an operative mortality of 15.2 per cent and thirty-one total gastric resections with an operative mortality of 30 per cent. The gastric resections were not subdivided into simple and complicated cases for this report. However, in 65 per cent of all resected cases there were metastases to the regional lymph node and/or extension of the carcinoma to other organs, necessitating extensive surgical procedures.

Those operative procedures, which were purely palliative, carried with them a not insignificant mortality. There were eighty-five laparotomies performed with a mortality rate of 8.2 per cent, twenty-five gastrojejunostomies with a mortality rate of 24 per cent and thirty enterostomies with a mortality rate of 13.4 per cent.

Of the fifty-one deaths after gastric resection, it was possible to obtain autopsies in forty-four of these cases. The major cause of death (Table VI) was peritonitis, which accounted for twenty-eight fatalities. Eight patients succumbed to pulmonary complications (atelectasis and pneumonia); four died of cardiac failure, three of renal complications, two of pulmonary embolism, one of cerebrovascular accident, and one of shock; in four cases the cause of death was undetermined. Most cases of peritonitis appeared before 1940, when the closed method of gastric resection was not routinely used. Since the routine use of the closed method of gastric resection and anastomosis, peritonitis has been infrequent indeed after simple gastric resection. The majority of the instances of peritonitis occurred after total gastrectomy or after complicated gastric resections which necessitated simultaneous excision of adjacent organs such as liver, pancreas and the colon.

Fate of Patients Surviving Gastric Resection

It was possible to determine the fate of each of the 307 patients subjected to gastric resection.† Two hundred and fifty-six patients survived operation, but it is only those patients operated on prior to 1943 that one can speak of as "three-year cures," and only those patients operated on prior to 1942 can be considered "five-year cures." Table IV indicates the number of patients who survived for three years after gastric resection in the years of 1936 to 1943. The percentage based on the total number of patients seen (447) was 10.7, but based on the number of those subjected to gastric resection (213) the percentage of three-year survivors reaches 29.4 per cent. In all, forty-seven patients survived three years, twenty-two patients survived five years, making 6.6 per cent of all patients seen (328), but if calculated on the basis of patients surviving gastric resection (102), the percentage of five-year survivors becomes 21.5.

The operability and resectability during the ten years of study have increased steadily, while the mortality has decreased. In 1936 the operability and resectability rates were 57 per cent and 28 per cent, whereas in 1945 these rates were respectively 88 and 80 per cent. The resectability rate for 1945 based on the number of patients explored was 89.7 per cent. The mortality rate for partial gastric resection in 1936 was 25 per cent, while in 1945 it was 4.9 per cent, which figure includes both total and subtotal gastrectomy. This aggressive attitude toward gastric resection has yielded greater return, for in 1936, of fifty-eight patients, only ten (16.7 per cent) left the hospital, whereas in 1945, of seventy-eight patients, fifty-eight (82.8 per cent) left the hospital with a chance for cure or worthwhile palliation.

A critical analysis of operative procedures

†We are indebted to referring physicians and members of the Department of Vital Statistics of the Minnesota State Public Health Department who aided us greatly in our follow-up of patients.

points quite clearly to the fact that only gastric resection offers any significant periods of palliation. After gastroenterostomy the average survival was 5.4 months. With enterostomy the survival period averaged 3.5 months. When gastric resection is done, even though a cure was precluded because of the extent of the disease or metastasis to regional nodes, the patients survived on an average of 22.4 months. Even in the presence of liver metastasis (provided they were not too extensive), the average number of months of palliation averaged approximately fifteen.

TABLE VII. SURVIVAL OF PATIENTS OPERATED ON IN THE YEARS 1936 TO 1943 INCLUSIVE

Year	Total Number of Patients	Number of Gastric Resections	A			B		
			Patients Surviving 3 Years		% of Those Surviving Gastrectomy	Patients Surviving 5 Years		% of Those Surviving Gastrectomy
			No.	%		No.	%	
1936	58	16	4	7.0	40.0	1	1.7	10.0
1937	47	17	5	10.0	45.0	4	8.5	30.7
1938	48	13	3	7.0	30.0	2	4.2	22.2
1939	47	20	3	6.0	23.0	3	6.4	23.1
1940	65	42	9	14.0	27.0	5	7.7	14.2
1941	63	28	7	11.0	44.0	7	11.1	3.3
1942	52	34	7	13.0	25.0			
1943	67	43	9	14.0	26.0			
Total	447	213	49	10.7	29.4	22	6.6	21.5

Summary and Conclusion

1. Carcinoma of the stomach assumes an important role in the over-all problem of malignancy, for it is responsible for approximately 40,000 deaths annually. As the age of the population continues to increase, the number of patients dying from this disease will also increase.

2. Little is known about the causes of carcinoma of the stomach in man. The relationship of atrophic gastritis, pernicious anemia, achlorhydria and hypochlorhydria, gastric polyp, gastric ulcer and heredity to the genesis of gastric carcinoma has been discussed.

3. Gastric cancer in its early stages is a silent disease. Well-developed symptoms usually appear only after the carcinoma has grown extensively.

4. Gastric carcinoma is apparently a slowly growing lesion, for patients with tumor in the residual gastric pouch after partial gastric resection are usually free of symptoms for approximately eighteen months.

5. In an effort to diagnose gastric cancer in its early silent form, the following groups of individuals over the age of fifty years were studied: (1) patients with achlorhydria and hypochlorhydria (less than 30° free acid) after histamine stimulation; (2) patients with gastric polyps; (3) patients with pernicious anemia; (4) patients with unexplained hemoglobin level of 11.0 grams or lower; (5) patients with occult blood in the stool; and (6) relatives of patients with gastric carcinoma. To date, 752 patients falling into these groups have had 1218 roentgenograms with the discovery of five silent gastric carcinomas and thirty-three polyps. These findings are sufficiently encouraging, it is felt, to warrant the establishment of a cancer detection center, where the patients will be investigated for all forms of silent visceral cancer, including gastric cancer.

6. The only effective mode of therapy of gastric cancer at present is gastric resection. Details of the type of gastric resection done at this clinic are described and discussed. Over a ten-year period (1936 to 1945 inclusive) 586 patients with gastric carcinoma have been seen at the University Hospitals. Nineteen of these patients were terminal when first seen, and no therapy was possible for these individuals. Four hundred and forty-seven patients were operated upon, an operability rate of 76.3 per cent. Three hundred and seven patients underwent gastric resection, for a resectability rate of 52.2 per cent. In this group there were thirty-one total gastric resections, and 276 partial resections. The previous highest resectability rate was 44.6 per cent, reported by Lahey.[18]

7. The mortality rate for all gastric resections was 16.6 per cent. For partial resections it was 15.2 per cent and for total gastric resections it was 30 per cent.

8. The chief causes of death postoperatively were, in order of frequency, peritonitis, pulmonary complications, cardiac failure, renal com-

plications, and pulmonary embolus. In four instances, the cause of death was undertermined.

9. Because sufficient time has not elapsed, the percentage of patients surviving three and five years can only be determined in relation to those patients operated on in the periods 1936 to 1943, and 1936 to 1941 respectively. The percentage of patients surviving three years after gastrectomy was 10.7 per cent, but based on the number of patients subjected to gastric resection, it was 29.4 per cent. The percentage of patients surviving five years was 6.6 per cent, but determined on the basis of the number of patients surviving gastric resection, it was 21.5 per cent.

10. Gastric resection was the only palliative procedure of value. The average number of months of palliation following gastric resection was approximately twenty-two.

11. The operability and resectability during the ten years of study have increased steadily, while the mortality has decreased markedly. In 1936 the operability and resectability rates were 57 per cent and 28 per cent, whereas in 1945 these rates were, respectively, 88 and 80 per cent. The resectability rate was 89.7 per cent, based on the number of patients explored in 1945. The mortality rate for partial gastric resection in 1936 was 25 per cent, while in 1945 it was 4.9 per cent, which figure includes both total and subtotal gastrectomy.

References

1. Bell, E. T.: Textbook of Pathology. Fourth ed., p. 342. Philadelphia: Lea and Febiger.
2. Borrmann, R.: Geschwulste des Magens und Duodenum. In Henke, F. and Lubarsch, O.: Hand. der Spez. Path. Anat. und Hist. Bd. 4, t. 1, pp. 812-1054. Berlin: J. Springer, 1926.
3. Bueermann, W. H.: A clinical and pathological study of the carcinomatous gastric ulcer, with particular reference to the grading of malignancy. West. J. Surg., (Nov. 1930-Dec. 1931).
4. Comfort, M. W.; Kelsey, M. P., and Berkson, J.: Gastric acidity before and after the development of carcinoma of stomach. J. Nat'l. Cancer Inst., 7:367-375, 1947.
5. Dailey, M. E., and Miller, E. R.: Research for symptomless gastric cancer in 500 apparently healthy men of 45 and over. Gastroenterology, 5:1-4, 1945.
6. Denk, W.: Zur Frage der Erblichkeit des Carcinoms. Ztschr. J. Krebsforch, 49:237-247, 1939.
7. Dublim, L. I.: A statistical analysis of the mortality from cancer, some fundamental aspects of the cancer problem, Science, supplement, 85:237, 1937.
8. Dyke, S. C., and Harvey, E.: Efficient treatment of pernicious anemia. Lancet, 2:59-62, 1933.
9. Hebbel, R.: Chronic gastritis; its relation to gastric and duodenal ulcer and to gastric carcinoma. Am. J. Path., 19:43-71, 1943.
10. Hebbel, R., and Gaviser, D.: Unpublished data.
11. Kaplan, H. S., and Rigler, L. G.: Pernicious anemia or carcinoma of the stomach: autopsy studies concerning their inter-relationship. Am. J. M. Sc., 209:339-340, (March) 1945.
12. Konjetzny, G.: Der oberflachliche Schleimhautkrebs des Magens. Chirurg., 12:192-202, 1940.
13. Lahey, F. H.: Cancer: A Manual for Practitioners. P. 103. Boston: Rumford Press, 1940.
14. Livingston, E. M., and Park, G. T.: End Results in the Treatment of Gastric Cancer. New York: P. B. Hoeber Co., 1939.
15. Magnus, H. A., and Ungley, C. C.: Gastric lesion in pernicious anemia. Lancet, 1:42-421, 1938.
16. McCarty, W.: Quoted from Wangensteen, O. H.: Surgical management of carcinoma of the stomach. Minnesota Med., 23:210-217, 1940.
17. Ogilvie, H.: Early diagnosis of cancer of the esophagus and stomach. Brit. M. J., 1:405-407, (Sept. 13) 1947.
18. Rigler, L. G.; Kaplan, H. S., and Fink, D. L.: Pernicious anemia and the early diagnosis of tumors of the stomach, J. A. M. A., 128:426-432, 1945.
19. Rigler, L. G., and Fink, D. L.: Pernicious anemia and carcinoma of the stomach. Staff Meet. Bull. Hosp. Univ. Minnesota, 14:112, 1945.
20. Rigler, L. G.: Pernicious anemia and the early diagnosis of carcinoma of the stomach. Radiology, 41:187-188, (Aug.) 1943.
21. Rodgers, H. W., and Jones, F. A.: Subacute ulceration of the stomach associated with atrophy of the gastric mucosa and with absence or diminution of the secretion of hydrochloric acid. St. Barth, Hosp. Rep., 71:141, 1938.
22. Sampson, D. A., and Sosman, M. O.: Prepyloric ulcer and carcinoma. Am. J. Roentgenol., 42:797, 1939.
23. Schindler, R.: Early diagnosis of cancer of the stomach: gastroscopy and gastric biopsies, gastrophotography and x-rays. J. Nat'l. Cancer Inst., 1:451-480, 1941.
24. Spriggs, E. I., and Marxer, O. H.: Polyps of stomach and polypoid gastritis. Quart. J. Med., 12:1-60, 1943.
25. State, D.; Moore, G., and Wangensteen, O. H.: Gastric carcinoma. J. A. M. A., 135:262-267, (Oct. 4) 1947.
26. State, D.; Varco, R. L., and Wangensteen, O. H.: An attempt to identify likely precursors of gastric cancer. J. Nat'l. Cancer Inst., 7:379-384, 1947.
27. St. John, F. B.; Swenson, P. C., and Harvey, H. D.: Experiments in early diagnosis of gastric carcinoma. Ann. Surg., 119:225-231, 1944.
28. Wangensteen, O. H.: Aseptic gastric resection. I. A method of aseptic anastomosis adaptable to any segment of the alimentary canal (esophagus, stomach, small or large intestine); II. Including preliminary description of subtotal excision of the acid secreting area for ulcer. Surg. Gynec. & Obst., 70:58-70, 1940.

FATAL ACCIDENTAL POISONING

Fewer accidental deaths have been recorded in recent years from virtually every type of poison-containing compound with the notable exception of the barbiturates, which now are far and away the leading cause of fatal accidental poisonings. In 1946 barbituric acid and its derivatives accounted for more than a quarter of all fatal accidental poisonings in the United States; in the early 1930's their share was only about 1/18 of the total. The pattern of accidental poisonings in the United States has undergone other marked changes over the years. Nux vomica and strychnine, which as recently as the late 1930's were charged with the loss of about 100 lives annually, took only 45 lives in 1946. Bichloride of mercury is another of the classical poisons that is causing fewer deaths now than formerly. Wood and denatured alcohol, which two decades ago exacted a death toll far greater than any other class of poisons, is now second in importance, taking 139 lives in 1946 as compared with 436 for the barbiturates.—*Bulletin, Metropolitan Life Insurance Company,* August, 1948.

PITFALLS IN THE EARLY DIAGNOSIS OF CARCINOMA OF THE LUNG

C. ALLEN GOOD, M.D.

Rochester, Minnesota

ACCORDING to statistics in the *Minnesota Cancer Bulletin*,[6] carcinoma of the lung causes about 6 per cent of all deaths due to malignant disease. Ten per cent of all deaths due to cancer in men are attributable to pulmonary carcinoma. Of the malignant lesions causing death in men it is the equal of cancer of the prostate and second only to cancer of the stomach. In some clinics carcinoma of the lung outranks all other forms of malignant disease as a cause of death in men.

At present the only effective therapeutic measure against carcinoma of the lung is surgical removal. Surgery offers about the same promise of cure of carcinoma of the lung as it does in carcinoma of the stomach. It is said that about a fourth of all carcinomas of the stomach can be removed when first encountered. If the lesion is removed, about a fourth of the patients live five years or more.[5] This means that six or seven of every 100 patients suffering from carcinoma of the stomach have a chance to be alive five years later. Recently Ochsner, DeBakey and Dixon reviewed their experience with resection for pulmonary carcinoma. About a third of the patients suffering from malignant disease of the lung who consulted them underwent resection. About a fourth of these survived at least five years. Their figures indicate that eight of every 100 patients suffering from carcinoma of the lung have a chance to live five years or more.

These same workers showed conclusively that the chances of survival after surgical extirpation of a bronchogenic carcinoma are much greater if the disease is localized. No patient in their series survived longer than three years after surgical extirpation if the disease had extended beyond the lung, either by encroachment on neighboring structures or by regional metastasis. On the other hand, more than half of their patients whose malignant lesions were localized lived three or more years after resection.

The results of surgical treatment of malignant disease of the lung can be improved by earlier diagnosis. Ochsner, DeBakey and Dixon concluded:

> "Every calculation, regardless of the standpoint from which it is made, indicates that while the patient's chances of survival are influenced by the type of care he receives, the important consideration is that he is seen early, so that complete removal of his lesion is possible and can be achieved without undue risk at operation. . . . The key to early diagnosis is the recollection of the possibility of the disease in all patients with symptoms referable to the chest, particularly those over forty years of age. Routine roentgenologic examination is the most valuable of all diagnostic methods. It should be supplemented as indicated by bronchography, bronchoscopy and biopsy, examination of expectorated material or of material aspirated at bronchoscopy, and, if the diagnosis cannot otherwise be arrived at, by exploratory thoracotomy."

Because so much depends on early diagnosis of carcinoma of the lung it behooves all physicians to be aware of the pitfalls which can delay early recognition of a pulmonary carcinoma. Some of these pitfalls stem from the fact that bronchogenic carcinoma can imitate the roentgenologic appearance of many benign pulmonary lesions. Because of the roentgenologic findings in cases of this type the possibility of carcinoma either is not considered or is dismissed by the consulting physician. It is the purpose of this paper to point out three of the ways in which carcinoma of the lung may masquerade as a benign lesion.

Carcinoma Simulating Benign Tumor

When bronchogenic carcinoma arises in the peripheral portion of the lung, it may grow without involving a major bronchus. For this reason the usual symptoms of cough and hemoptysis may not appear for many months. A malignant lesion of this type is seen on the roentgenogram as a single circumscribed mass. The size of the mass depends on the age and rapidity of growth of the lesion. The smaller the nodule is when first encountered the more likely it is to be considered benign by both roentgenologist and consulting physician. The prognosis following re-

From the Section on Roentgenology, Mayo Clinic, Rochester, Minnesota.

Read at the annual meeting of the Minnesota State Medical Association, Minneapolis, Minnesota, June 7, 1948.

moval of such a lesion is usually very favorable, yet, a course of watchful waiting is frequently advised instead of operation.

Seventy-four per cent of fifty-three single nodular pulmonary lesions proved to be malignant when exploratory operation was performed by Clagett after all other means of diagnosis had been exhausted.[2] On the other hand, the risk of exploratory thoracotomy is less than 1 per cent in the hands of competent thoracic surgeons. Certainly, if the tumor has eluded diagnosis by all other means, the chance that a single circumscribed mass in the lung is malignant far outweighs the risk of exploration. Add to this the fact that most of the benign lesions encountered in this type of case are best treated by surgical extirpation and the arguments in favor of immediate exploration far outweigh those in favor of watchful waiting.

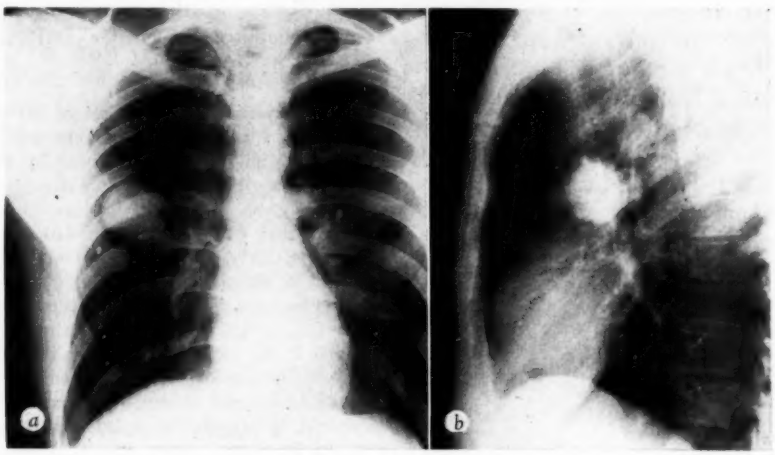

Fig. 1 (Case 1). Round mass in right upper lobe which proved to be hamartoma; *a*, anteroposterior; *b*, lateral view.

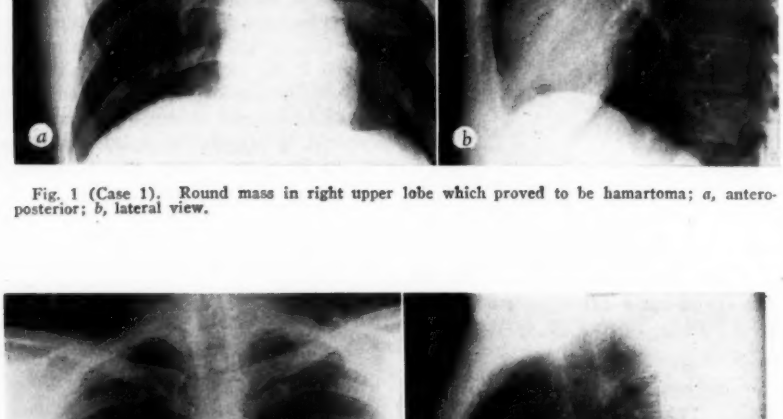

Fig. 2 (Case 2). Round mass in right lower lobe which proved to be a carcinoma; *a*, anteroposterior; *b*, lateral view.

Case 1.—A man, thirty-four years old, was rejected by the Army in 1944 because of a shadow seen in the roentgenogram of the lungs made at the time of his examination for induction. The roentgenologic examination was repeated at intervals subsequently and in

December, 1945, he was told that the shadow had grown larger (Fig. 1 *a* and *b*). Although he had no symptoms referable to the respiratory system he was operated on. The right upper lobe was removed and a benign hamartoma was found.

Case 2.—A man, thirty-four years old, was rejected by the Army in 1944 because of a shadow seen on the roentgenogram of the lungs made at the time of his examination for induction. The roentgenologic examination was repeated at intervals subsequently and sometime in 1945 he was told that the shadow had grown larger (Fig. 2 *a* and *b*). He had recently experienced pain in the chest and had expectorated some blood-streaked sputum. He was operated on and right lower lobectomy was performed. In the right lower lobe of the lung was found an adenocarcinoma of the bronchogenic variety.

Cases 1 and 2 illustrate the difficulty experienced by the roentgenologist in distinguishing a carcinoma from a benign tumor. Both men were the same age. Both tumors were discovered at the time of examination for induction into the Army and both showed evidence of growth on subsequent roentgenograms. The only point of difference was the fact that the patient who harbored the carcinoma had symptoms referable to the respiratory system while the other patient had none.

Carcinoma Simulating a Pulmonary Abscess

Sometimes a carcinoma in the peripheral portion of the lung undergoes necrosis or an abscess cavity forms in the lung behind a malignant lesion which obstructs a bronchus. In either instance the roentgenologic picture may imitate that of pulmonary abscess. In such a case the malignant nature of the lesion may be overlooked while conservative measures are employed in treatment. Valuable time is lost in waiting for the cure which will not follow.

It is difficult to formulate a hard and fast rule of procedure for cases of this sort. Conservative measures have a place in the treatment of pulmonary abscess, although there is a growing tendency on the part of thoracic surgeons to consider an open type of operation or lobectomy as the treatment of choice. The fact that carcinoma of the lung may masquerade as a pulmonary abscess must always be kept in mind. Graham and associates stated that "about 10 per cent of the cases of chronic lung abscess in the adult have been associated with a carcinoma of the lung or bronchus." In a series of 165 cases of pulmonary carcinoma reported by Overholt 8 per cent were thought to be cases of pulmonary abscess when first seen. Certainly all physicians should maintain a high degree of suspicion for all chronic cavitating lesions of the lung encountered in adult patients. All possible diagnostic procedures should be employed in an endeavor to uncover the exact nature of the lesion. Study of the bronchial secretions, bronchoscopy with biopsy and even exploratory thoracotomy are to be recommended.

Too much emphasis should not be placed on the thickness of the wall of the abscess, the presence or absence of surrounding pneumonitis or other roentgenologic features, for it has been found that none of these are truly indicative of the benignancy or malignancy of the lesion. Neither should negative findings from analysis of the sputum or from bronchoscopic examination be taken to indicate a benign process.

Case 3.—A man, fifty-three years old, was first seen at the Mayo Clinic in 1944 because of asthma. A roentgenogram of the chest at that time showed no evidence of disease. He returned three years later because he had suffered from hemoptysis, pain in the chest and loss of weight. A lesion had been found in the right lung by means of the roentgenologic examination (Fig. 3 *a* and *b*). Examination of the sputum disclosed no malignant cells. Pus was seen in the bronchus of the right upper lobe at the time of bronchoscopy, but no tumor was noted. The patient was operated on and a chronic pulmonary abscess was found in the right upper lobe of the lung. Open drainage was established.

Case 4.—A man, fifty-one years old, had suffered from asthma for ten years. For three months he had experienced pain in the chest and had expectorated bloody sputum. Roentgenograms of the chest showed a lesion in the right lower lobe (Fig. 4 *a* and *b*). Bronchoscopic examination was done and tissue removed from the bronchus to the right lower lobe was said by the pathologist to show squamous cell epithelioma. Surgical exploration was performed, but the lesion proved to be inoperable.

Cases 3 and 4 illustrate the frequent impossibility of distinguishing roentgenologically between a cavitating carcinoma and a lung abscess. Both patients had suffered from asthma for several years. Both had experienced recent attacks of pain and hemoptysis. Because the lesion was accessible to the bronchoscopist in the case of the carcinoma a diagnosis was possible before sur-

gical exploration. If it had been situated in a part of the lung in which it could not be reached bronchoscopically, surgical intervention would have been necessary to establish the diagnosis, are administered, the patient may respond rapidly, sometimes even may appear cured subjectively. The proper diagnosis in such cases will be overlooked if the physician fails to order a

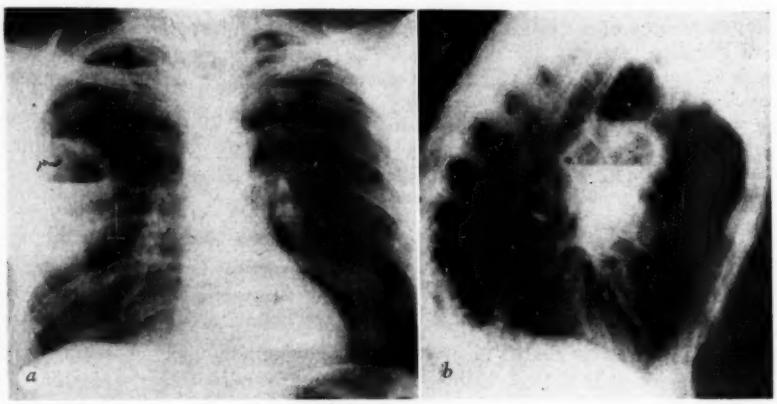

Fig. 3 (Case 3). Cavitating lesion with fluid level which proved to be a chronic pulmonary abscess; *a*, anteroposterior; *b*, lateral view.

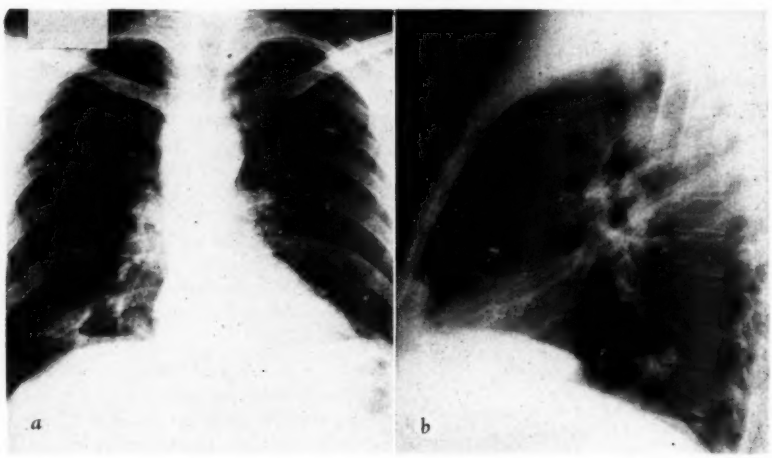

Fig. 4 (Case 4). Cavitating lesion with fluid level which proved to be a carcinoma; *a*, anteroposterior; *b*, lateral view.

just as it was in the case of the pulmonary abscess.

Carcinoma Simulating Pneumonia

Many pulmonary carcinomas develop in the major bronchi and cause bronchial obstruction. Often it happens that the onset of symptoms coincides with the development of this obstruction. In these cases the history, physical findings and roentgenologic features may mimic those of pneumonia. If penicillin or other antibiotic agents follow-up roentgenogram. Not until the next attack of bronchial obstruction occurs or until other signs appear which necessitate revaluation of the diagnosis will the exact nature of the disease be suspected.

If carcinoma is the underlying cause of the patient's illness, the roentgenologic appearance of the lungs will not return to normal, no matter how good the response to therapy. In order to be on the safe side no adult patient who has suffered from an attack of what appears to be

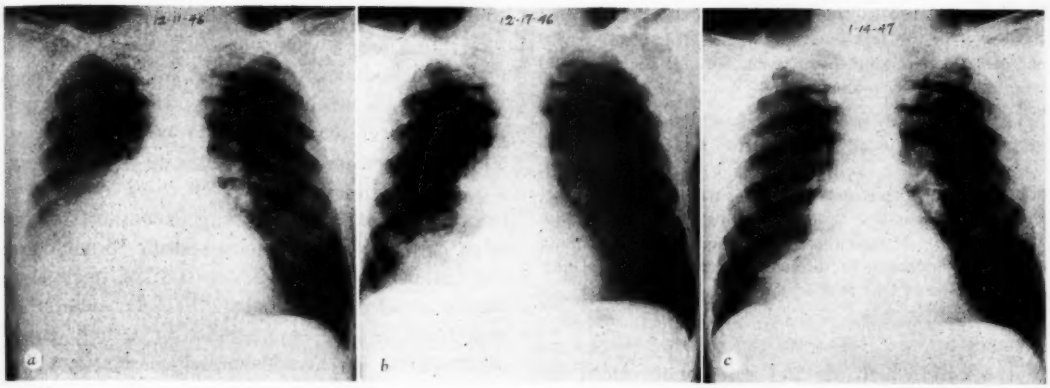

Fig. 5 (Case 5). *a*, Lesion of right lower lobe which was thought to be pneumonia; *b*, same lesion a week later after patient had received penicillin. The lesion appears to be less extensive, as though it were improving; *c*, five weeks after *a* the lesion is still present. It proved to be a carcinoma at the junction of the bronchi to the right middle and lower lobes.

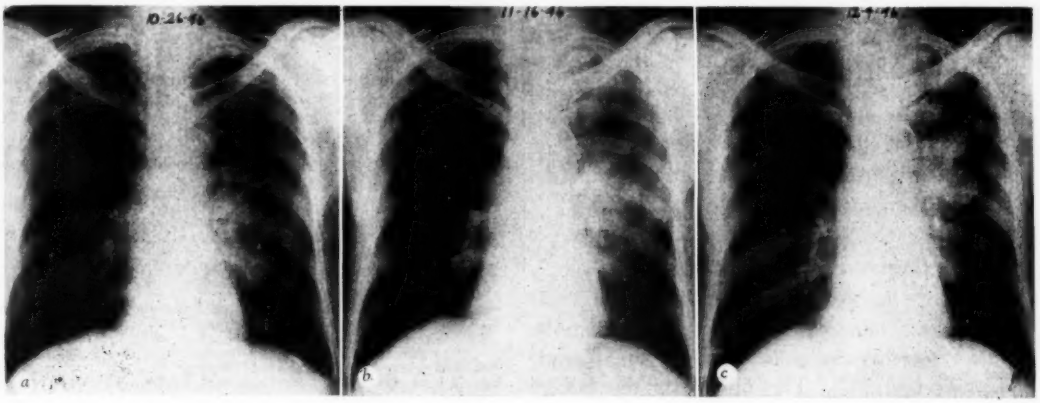

Fig. 6 (Case 6). *a*, Lesion in left lung which was thought to be pneumonia; *b*, same lesion three weeks later after patient had received penicillin. The lesion is not only still present but is more extensive; *c*, same lesion five and one half weeks after *a*. It proved to be a carcinoma of the bronchus to the left upper lobe.

pneumonia should be considered to be well until a follow-up roentgenogram of the chest shows complete disappearance of the lesion originally noted. As long as a shadow persists in the lung all of the usual methods of examination, such as study of the bronchial secretions, bronchoscopy, bronchography, and even exploratory thoracotomy should be employed to uncover the true nature of the disease.

Case 5.—A man, sixty-four years old, became acutely ill and experienced chills and high fever. He entered a hospital where a diagnosis of pneumonia was made after roentgenologic examination (Fig. 5 *a*). Treatment with penicillin, streptomycin and one of the sulfonamides was begun. He improved rapidly. Within a few days his temperature had returned to normal and another roentgenogram was made which showed a decrease in the involvement of the lungs (Fig. 5 *b*).

A week or so following his dismissal from the hospital fever recurred. A roentgenogram made about four weeks after his last examination showed that the lesion in the right lung had not disappeared (Fig. 5 *c*). For this reason a bronchoscopic examination was carried out. A carcinoma was found at the junction of the bronchi to the right middle and lower lobes.

Case 6.—A man, sixty-nine years old, was first examined in September, 1945. He was found to have benign hypertrophy of the prostate. A roentgenogram of the chest made at that time was considered to be normal. The patient returned in October, 1946, with symptoms referable to the urinary tract. He was found to have a temperature of 100.4° F. He said that he had caught cold three days before, had suffered from a chill and had begun to cough at that time. Roentgenologic examination revealed a lesion in the left lung which was thought to represent pneumonia (Fig. 6 *a*). The patient entered a hospital and was treated with penicillin for ten days. When at the end of this period

his fever did not subside and a roentgenogram showed the lesion in the left lung to persist, bronchoscopy was performed. No tumor was seen, nor did the bronchial secretions contain malignant cells.

The patient was kept under observation. Roentgenograms were made at intervals and these continued to show the lesion in the left lung (Fig. 6 *b* and *c*). Another bronchoscopic examination failed to find malignant cells or tissue. Finally, exploratory thoracotomy was advised. At operation a squamous cell epithelioma was found involving the bronchus to the left upper lobe. Pneumonectomy was carried out.

Cases 5 and 6 illustrate the type of carcinoma of the lung which imitates pneumonia from the clinical and roentgenologic points of view. Both patients were thought to have pneumonia and both were treated with antibacterial agents. In each case the true nature of the disease was discovered because subsequent roentgenograms failed to show complete disappearance of the lesion. Even when clinical signs and symptoms of pneumonia disappear, follow-up roentgenograms should be made to be sure that the disease is no longer present. A persistent shadow on the roentgenogram demands further investigation.

Summary and Conclusions

Three of the pitfalls which delay the early diagnosis of carcinoma of the lung result from the tendency for this malignant lesion to masquerade in benign costume. The pitfall of the benign tumor can be avoided by the early use of exploratory thoracotomy whenever a single circumscribed mass which eludes diagnosis by all other methods is present in the lung. The pitfall of the pulmonary abscess can be avoided by the analysis of sputum, bronchoscopy, and biopsy and even exploratory thoracotomy in all cases of chronic cavitating disease of the lung encountered in an adult patient for which some specific etiologic factor cannot be found. The pitfall of pneumonia can be avoided by the use of the follow-up roentgenogram, and by maintenance of a high degree of suspicion for any lesion which does not disappear roetgenologically in ten to fourteen days. A constant awareness of these problems by all physicians will make for earlier diagnosis of malignant disease of the lung. This in turn will improve the results of surgical procedures, the only satisfactory method of treatment for this disease known today.

References

1. Graham, E. A., Singer, J. J., and Ballon, H. C.: Surgical Diseases of the Chest. Philadelphia: Lea & Febiger, 1935.
2. Johnson, C. R., Clagett, O. T., and Good, C. A.: The importance of exploratory thoracotomy in the diagnosis of certain pulmonary lesions. Unpublished data.
3. Ochsner, Alton, DeBakey, M. E., and Dixon, Leonard: Primary pulmonary malignancy treated by resection; an analysis of 129 cases. Selected Writings by the Staff Members of the Ochsner Clinic, 6:33-50, (June 30) 1947; Ann. Surg., 125:522-540, (May) 1947.
4. Overholt, R. H.: A common masquerading lung disease. Dis. Chest, 9:197-211, (May-June) 1943.
5. Walters, Waltman, Gray, H. K., and Priestley, J. T.: Carcinoma and other Malignant Lesions of the Stomach. Philadelphia: W. B. Saunders Company, 1942.
6. Where does the cancer problem lead? Minnesota Cancer Bull., 1: No. 2, 1-6.

THE FORTIFICATION OF MILK WITH VITAMINS A AND D

For many years the Council on Foods and Nutrition has approved fortification of milk with vitamin D. The Council has stated the opinion that fortification of milk as a general purpose food with vitamin A is not in the interest of public health. However, no objection is taken to the concurrent presence of vitamin A when the preparation used for fortifying with vitamin D contains vitamin A in natural association.

The Food and Drug Administration, in defining a standard of identity for evaporated milk, took no exception to the concurrent presence of both vitamins A and D in fortifying agents when both vitamins are derived from natural sources.

Fish liver oil concentrates, sometimes used for fortifying milk with vitamin D, often contain relatively large amounts of vitamin A. Milk fortified with such concentrates has been accepted by the Council, and a statement of vitamin A content has been permitted on the label. However, claims concerning increased nutritive value because of the vitamin A content have not been permitted.

Before the Council can accept claims for milk fortified with vitamin A it seems desirable to have evidence that such fortification is in the interest of public health, even though the procedure is apparently harmless. Such evidence appears to be lacking. Diets that contain appropriate amounts of milk are likely to contain adequate vitamin A. The evidence now available does not warrant a change in the standing decisions of the Council on Foods and Nutrition concerning specific fortification of specific foods to include fortification of milk with vitamin A.

In its acceptance of milk fortified with preparations from natural sources that contain both vitamins A and D, the Council has assumed that the presence of vitamin A is incidental. In those instances in which the vitamin A component is adjusted to supply a specified amount, presumably the amount of vitamin A is not incidental and fortuitous. In any case, the addition of vitamin A does not constitute sufficient reason for acceptance of advertising that suggests special nutritional advantages. The addition of vitamin A to milk, already a good source of this nutrient, may add to the cost of the milk and is without apparent advantage to public health.—Council on Foods and Nutrition, J.A.M.A., 138:23, (Sept. 4) 1948.

The A. H. Sanford Lectureship

Introduction to Lectureship

KANO IKEDA, M.D.

Saint Paul, Minnesota

The members of the Minnesota Society of Clinical Pathologists are highly honored to have the privilege of sponsoring an annual Lectureship in Pathology and dedicating it to the Minnesota State Medical Association, in honor of one of its own members, Dr. Arthur H. Sanford, Rochester, Minnesota.

The objective of the lectureship is twofold: first, to honor one of its most distinguished members who stands among the few foremost clinical pathologists of the day, and who has contributed heavily towards the moulding of the present-day science of medical diagnosis through laboratory methods; and secondly, through its medium, to bring the clinical pathologist closer to everyday practice of medicine, whereby the place of clinical pathology and laboratory diagnosis may be made more fully appreciated by the general practitioner.

It is hoped by the members of the Minnesota Society of Clinical Pathologists that these lectures to be delivered at a general session of the Minnesota State Medical Association, annually, by an outstanding man in the specialty which they represent, may be the means of perpetuating these objectives.

Dr. Arthur H. Sanford, a native of the state of Iowa, received his Master's degree in physiology, followed by a degree of Doctor of Medicine, from Northwestern University in 1907. He served as professor of physiology at Marquette University until 1911, when he came to the Mayo Clinic as bacteriologist. He became director of clinical laboratories and head of the section of clinical pathology, and since April, 1946, has been senior consultant in the section of clinical pathology. He is professor of clinical pathology of the Mayo Foundation, and special consultant of the United States Public Health Service. He received a Northwestern University alumnus award in 1940. Dr. Sanford is a founding member and past president of the American Society of Clinical Pathologists and of the American Board of Pathology, and a member of numerous scientific organizations and honor societies. He is a co-inventor with Dr. Charles Sheard, of the Mayo Clinic, of one of the first electro-photometric instruments to be put into practical use in the clinical laboratory, and the originator of numerous useful laboratory procedures which are employed daily in diagnosis. He is the author of many scientific articles dealing with clinical pathology. Dr. Sanford is well known for his popular textbook, "Clinical Diagnosis by Laboratory Methods," which is universally recognized as one of the most authoritative books on clinical pathology and laboratory medicine.

The members of the Minnesota Society of Clinical Pathologists are fortunate indeed to have, as a fellow member, a man of Dr. Sanford's attainments, whose leadership in their specialty is recognized wherever scientific laboratory methods are employed in medical diagnosis. We honor ourselves by dedicating to you this annual lectureship to honor Dr. Sanford, a pioneer clinical pathologist, for his contributions to the practice of medicine, which may be a perpetual source of inspiration to the practicing physicians of Minnesota.

* * *

A brief remark by Dr. Sanford followed.

The first A. H. Sanford Lecture was delivered by Dr. Robert Hebbel for Dr. E. T. Bell, Professor of Pathology and Head of the Department, The University of Minnesota Medical School, on "Pathology of Diabetes." This lecture is being published elsewhere.

Introduction of the 1948 Speaker

A. S. BAGGENSTOSS, M.D.

President of the Minnesota Society of Clinical Pathologists

Members of the Minnesota State Medical Association and Guests: At the inauguration of the Arthur H. Sanford Lectureship last year, the distinguished secretary and former president of our Society, Dr. Kano Ikeda, stated that the objective of this lectureship is twofold: first, to honor one of its most distinguished members, Dr. Sanford, who stands among the foremost clinical pathologists of the day; and, second, to bring the clinical pathologist closer to the everyday practice of medicine to the end that the place of clinical pathology and laboratory diagnosis may be more fully appreciated by the general practitioner.

In the furtherance of these objectives, we have been fortunate indeed in obtaining as our speaker for the occasion, Dr. Benjamin J. Clawson, Professor of Pathology at the University of Minnesota. Dr. Clawson received his Doctor of Medicine degree in 1917 and his Doctor of Philosophy degree in 1919 at the University of Chicago. The trite expression, "he needs no introduction" was never more apt, for he has been on the faculty of the University of Minnesota since 1921. For many of you, as for me, this occasion will awaken memories of a kindly, stimulating and forceful teacher. Those of you who have had the fortunate experience of being a student under him know whereof I speak. However, it is not only as a teacher but as an investigator that Dr. Clawson has left his mark. No one in the medical world of today can write or talk or even think of heart disease or rheumatic fever without mentioning his name. Of his many outstanding contributions, I shall take time to mention only a few: his studies on the etiology of rheumatic fever, the pathogenesis of calcareous aortic stenosis, the Aschoff body, the relationship of subacute bacterial endocarditis to rheumatic endocarditis, the experimental work on the use of B.C.G. as an immunizing agent and his classic chapter on diseases of the heart in Dr. Bell's textbook. As one might anticipate, this scientific productivity has received recognition by his election to numerous scientific and honorary societies and inclusion of his name in several compendiums of outstanding scientists: the American Association of Pathologists and Bacteriologists; the American Society of Bacteriologists; Sigma Xi; and American Men of Science—to mention but a few of them. It is with great pleasure that I present to you Dr. Benjamin J. Clawson, who will speak on Rheumatic and Bacterial Endocarditis.

Dedicatory address at the Minnesota State Medical Association, at Duluth, July 1, 1947.

RHEUMATIC AND BACTERIAL ENDOCARDITIS

1740 Cases

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THIS discussion is an analysis of the types of endocarditis from a group of 1,740 cases of rheumatic and bacterial endocarditis in 37,725 autopsies (4.6 per cent) and in a total of 6,283 cardiac deaths in the same series of autopsies (27.6 per cent) (Table I). Of the 1,740 cases of endocarditis, 1,104 (63.4 per cent) are rheumatic and 636 (36.6 per cent) are bacterial (Table II). When it is remembered that nearly 90 per cent of the cases of bacterial endocarditis have a background of rheumatic valvulitis, it becomes evident that the rheumatic cases greatly outnumber the bacterial.

TABLE I. INCIDENCE OF RHEUMATIC AND BACTERIAL ENDOCARDITIS
37,725 autopsies and 6,283 cardiac deaths

	Per cent Autopsies	Per cent Cardiac deaths
A. Rheumatic (1,104 cases)	2.9	17.6
B. Bacterial endocarditis (626 cases)	1.7	10.1
C. Total (1,740 cases)	4.6	27.7

Depending upon the stage of the disease at which death occurred, the rheumatic group is divided into acute rheumatic endocarditis, recurrent rheumatic endocarditis, valve deformities and adherent pericardium. The bacterial group is separated into primary and secondary acute bacterial endocarditis, in which the clinical course is not more than six weeks, and subacute bacterial endocarditis, which has a duration of more than six weeks. The incidence of each type is shown in Table II.

It is impossible to study one of the two types of endocarditis without considering the other. This is especially true of the bacterial type, since it so commonly has a background of rheumatic endocarditis, acute, recurrent, or valve deformities (healed or nearly healed). The relationships in many cases are similar, but dissimilar ones are encountered. An effort is made to evaluate the significance of these relationships. The chief relationships observed and analyzed may be grouped as clinical, bacteriological, immunological and anatomical.

TABLE II. INCIDENCE OF TYPES OF RHEUMATIC ENDOCARDITIS (2.9 PER CENT) AND BACTERIAL ENDOCARDITIS (1.7 PER CENT)
37,725 autopsies, a total of 1,740 cases (4.6 per cent)

	Percentage of groups	Percentage of total group
Rheumatic (1,104)	100.0	63.4
1. Acute rheumatic (116)	10.5	6.6
2. Recurrent rheumatic (101)	9.2	5.8
3. Valve deformities (850)	77.0	48.8
4. Adherent pericardium (37)	3.3	2.1
Bacterial (636)	100.0	36.6
1. Primary acute (55)	8.7	3.2
2. Secondary acute (135)	21.2	7.8
3. Subacute (446)	70.1	25.6

Clinical Relationships

Age.—Age is an outstanding clinical dissimilar relationship. Rheumatic endocarditis is the type found primarily in the pediatric wards, while on the other hand, the internist generally sees the subacute bacterial type. The separating line is close to the fifteenth year.

Cohn,[5] in his analysis of a large number of cases of rheumatic endocarditis, found that the first manifestations of acute rheumatic endocarditis occurred under thirteen years of age in 86 per cent of his cases. Gelfman,[7] in an analysis of 578 cases of rheumatic heart disease, found subacute bacterial endocarditis as a cause of death to be particularly low under the age of ten. In an analysis of the ages in which death occurred in ninety-eight cases of acute rheumatic endocarditis and 417 cases of subacute bacterial endocarditis, I found that 83.3 per cent of the individuals with acute rheumatic endocarditis who died in the first attack were under twenty years of age. Only 11 per cent of the 417 cases of subacute bacterial endocarditis were under twenty years of age at

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TABLE III. AGES AT WHICH DEATH OCCURRED
Acute rheumatic endocarditis (96 cases); subacute bacterial endocarditis (417 cases)

Decades	Acute rheumatic		Subacute bacterial	
	No.	Per cent	No.	Per cent
1	40	41.6	8	1.9
2	40	41.6	38	9.1
3	9	9.3	91	21.8
4	5	5.2	98	23.5
5	1	1.0	79	18.9
6	0	0.0	56	13.4
7	0	0.0	36	8.6
8	1	1.0	8	1.9
9	0	0.0	3	0.7
10	0	0.0	0	0.0
Below 20	80	83.3	46	11.0
Above 20	16	16.6	371	88.9

TABLE IV. INTERVAL BETWEEN ACUTE RHEUMATIC ENDOCARDITIS AND THE BEGINNING OF SUBACUTE BACTERIAL ENDOCARDITIS
In patients 20 years old or younger (25 cases)

Interval	No.	Per Cent
1. Continuous	17	68.0
2. Two months to one year	3	12.0
3. Three years	2	8.0
4. Eight years	1	4.0
5. Nine years	1	4.0
6. Twelve years	1	4.0

the time of death (Table III). The reason for this age difference in the two types of endocarditis has not been determined.

Transition of Acute Rheumatic into the Subacute Bacterial.—A gradual passing of acute rheumatic endocarditis into the bacterial type is commonly observed by the clinicians and the pathologists. The bacterial type is more severe clinically and before the use of penicillin nearly always ended fatally. An original diagnosis of acute rheumatic endocarditis is often changed to subacute bacterial endocarditis, if the case progresses toward a fatal termination. In a group of twenty-five cases of established subacute bacterial endocarditis in patients not more than twenty years old, seventeen (68 per cent) had a continuous course from acute rheumatic endocarditis into the typical subacute bacterial type. In three, the periods between the manifestations of the two diseases were two months to one year (Table IV). The transition from the acute rheumatic to the subacute bacterial type may be so gradual that it is impossible to say where the one ends and the other begins.

Background of the Subacute Bacterial Type.—A third clinically observed relationship is that in

TABLE V. EVIDENCES OF A RHEUMATIC BACKGROUND IN SUBACUTE BACTERIAL ENDOCARDITIS
219 cases

Evidence	Number Examined	Number Positive	Per Cent Positive
1. History of rheumatism	101	82	81.2
2. Thickened involved valve	219	151	68.9
3. Thickened noninvolved valve	219	22	10.0
4. One or more	219	178	81.3

TABLE VI. HOW DEATH OCCURS WITH RHEUMATIC HEART DISEASE
1407 cases

Kinds	No.	Per cent
Acute rheumatic	114	8.1
Recurrent rheumatic	97	6.8
Valve deformities	784	55.7
Adherent pericardium	37	2.6
Subacute bacterial endocarditis	375*	26.7
Total	1407	99.9

*90 per cent of subacute bacterial endocarditis.

nearly 90 per cent of the cases of subacute bacterial endocarditis there is a background of a rheumatic valvular lesion, acute, partially healed or completely healed (Christian[2]). Christian observed that the determinative background of subacute bacterial endocarditis was rheumatic heart disease in 89.33 per cent of 150 consecutive adult cases of subacute bacterial endocarditis caused by *streptococcus viridans* and in 90.24 per cent of 174 consecutive adult cases of subacute bacterial endocarditis of all causes studied at the Peter Bent Brigham Hospital. In a series of 219 of our cases of subacute bacterial endocarditis, in which descriptions were sufficient to permit a fairly accurate evaluation of the degree of valvular deformity and in which a history of rheumatism was given, it was apparent that a background of rheumatic fever was present in at least 178 of the 219 cases (81.3 per cent) (Table V).

Subacute Bacterial Endocarditis a Cause of Death in Rheumatic Heart Disease.—A fourth clinical relationship is that subacute bacterial endocarditis is the primary cause of death in from 25 to 30 per cent of all cases of rheumatic valve deformities. Table VI shows how death occurred in 1,407 cases of rheumatic heart disease. On the basis of there being a rheumatic background in 90 per cent of the cases of subacute bacterial endocarditis, it is noted that 26.7 per cent of all patients with rheumatic heart diseases died from subacute bacterial endocarditis. When the acute

and recurrent rheumatic cases are omitted, the percentage is increased to about 30.

matic type, antistreptolysins. These antistreptolysins tend to disappear, since they are present in only about 30 per cent of individuals with healed valve deformities in whom obviously previous attacks of acute rheumatic endocarditis have occurred (Wimblad[12]). The maximum streptococcic agglutination titers in normal individuals and in those with acute rheumatic endocarditis and subacute bacterial endocarditis are recorded in Table VIII. The percentage of positive findings in dilutions above 1-400 is approximately the same in the two types of endocarditis and definitely higher than in the normal cases.

TABLE VIII. MAXIMUM STREPTOCOCCIC AGGLUTINATION TITERS IN NORMAL PEOPLE, ACUTE RHEUMATIC ENDOCARDITIS AND SUBACUTE BACTERIAL ENDOCARDITIS

Dilution	Below 50	50	100	200	400	800	1600	3200	6400	12800	Above 400
Normal (81)	2%	5%	2%	18.5%	44.7%	26%	2%	0%	0%	0%	28%
Acute rheumatic (81)	0%	1%	0%	1%	9.%	15%	10%	26%	28%	10%	92%
Subacute bacterial (13)	0%	0%	0%	0%	7.6%	7.6%	7.6%	0%	46.2%	30.8%	89%

Bacterial Relationships

The organisms found in the blood stream in both types are usually *Streptococcus viridans*, a few per cubic centimeter of blood in the acute rheumatic when present and many in the bacterial. While the general belief is that acute rheumatic fever is in some way closely related to hemolytic streptococcic sore throat, yet, as stated by Jones[4] and according to the observations of others, the organisms found in the blood stream are generally *Streptococcus viridans*. There are different opinions concerning the significance of these organisms in the blood. Streptococci have been cultured in from 50 to 60 per cent of patients with acute rheumatic fever. In a series of 252 of our cases of subacute bacterial endocarditis, there were positive bacterial findings reported in 207 (82.1 per cent). Of these, *Streptococcus viridans* was the organism cultured from the blood in 170 (67.5 per cent) (Table VII).

TABLE VII. BACTERIAL FINDINGS IN SUBACUTE BACTERIAL ENDOCARDITIS

252 cases

Organisms	Number	Per Cent
1. Str. viridans	170	67.5
2. Str. hemolyticus	16	6.3
3. Staphylococcus	14	5.5
4. Brucella	4	1.6
5. H. influenzae	1	0.4
6. Gonococcus	2	0.8
Total	207	82.1

Immunological Relationships

Humoral Antibodies.—Both types of endocarditis have high titers of streptococcic humoral antibodies, as agglutinins, precipitins, complement-fixing antibodies and, generally in the acute rheu-

Hypersensitiveness.—Skin tests to streptococci or streptococcic products are positive in 75 to 85 per cent of patients with acute rheumatic endocarditis, 50 per cent in those with healed valve deformities, and are generally negative in those with subacute bacterial endocarditis (Birkhaug,[1] Gibson, Thomson and Stewart,[8] and Favour, Janeway and Gibson and Levine[6]).

The bacterial type of allergy in rheumatic fever has been studied by Swift,[10] Birkhaug,[1] Thomson, Gibson and Stewart,[8] and others. It has been shown by intradermal skin tests that a high percentage of patients with acute rheumatic fever are allergic to streptococci and that patients with bacterial endocarditis who have been clinically cured by penicillin therapy again become hypersensitive.[6] This suggests that patients having bacterial endocarditis had previously been allergic but had been desensitized by heavy blood stream infection.

A point to be considered in thinking of the role of delayed hypersensitiveness in rheumatic endocarditis is whether the rheumatic child was allergic before contracting rheumatic fever or whether

allergy exists as a result of rheumatic infection or of intercurrent infections with increasing age. Birkhaug's[1] observations showed that 20 per cent of normal children and 85 per cent of rheumatic children were allergic to streptococci. Gibson, Thomson and Stewart,[8] by skin tests with extracts of hemolytic streptococci, found that the percentage of allergy rose from the age of five years to that of fifteen years, when it ceased to increase in both rheumatic and control children. At fifteen years of age, there was practically no difference in the frequency and the degree of allergy to *Streptococcus hemolyticus* extracts (68 per cent in rheumatic, 66 per cent in controls). They concluded that their word did not add much to support the allergy theory in the pathogenesis of acute rheumatic fever. The same conclusion was reached by Jones.[9] Clawson and Wetherby[3] found that 50 per cent of apparently normal people gave a positive intracutaneous reaction to *Streptococcus viridans*. Hypersensitiveness to streptococcic products is rare in young children when acute rheumatic fever begins, but is common in adults. It is especially high in both children and adults who have or have recently had rheumatic fever. Rheumatic fever seldom occurs for the first time in adults, and bacterial endocarditis is rare in adults except in people who have previously had rheumatic endocarditis. It may be suspected that allergy may be a factor in the beginning of bacterial endocarditis, rather than in the rheumatic type.

Anatomical Relationships

Gross Vegetations.—In the endocarditis immediately associated with acute rheumatic fever (rheumatic endocarditis, simple verrucous endocarditis), the heart valves on gross examination show small, rather smooth, globular nodules at points of contact of the leaflets a short distance back from the free margin on the atrial surfaces of the mitral and tricuspid and on the ventricular surfaces of the aortic and pulmonary valves. Usually these vegetations are not extensive enough to interfere seriously with the function of the valves.

In subacute bacterial endocarditis, the vegetations are, in the main, large, soft and villous. The consistency and size of the subacute bacterial vegetations make it easily possible for particles to break loose into the blood stream and produce the embolic processes so commonly found in subacute bacterial endocarditis.

Microscopic Vegetations.—Microscopically, the acute rheumatic lesions show the inflammation within and throughout the substance of the leaflet. The elevated nodules form only at the line of contact of the leaflets. An important histological feature is the presence of hyaline fibrinoid material within the valves. A small platelet thrombus is present in which bacteria are not found. A cellular inflammatory reaction occurs with the fibrinoid changes and is chiefly a proliferative inflammation. The cells are spindle-shaped and rounded, generally with an abundant cytoplasm. They are usually mononuclear, but multinucleated forms are common. They are derived from fibrocytes, histiocytes, blood lymphocytes and from a special histiocyte, the Anitschkow cell. This cell is peculiar in being found only in the heart. Definite Aschoff nodules are frequently seen in the acutely inflamed valve.

In subacute bacterial endocarditis all the structures of the acute rheumatic valve are present, and in addition there is large platelet thrombus in which many bacteria, generally in colonies, are usually found. The infected thrombus is the distinguishing characteristic lesion of bacterial endocarditis.

Vegetations characteristic of the rheumatic type may generally be found on the same cusps with the vegetations of the subacute bacterial type (80 per cent Clawson,[4] 100 per cent Von Glahn and Pappenheimer[11]). Acute rheumatic vegetations may be present on the cusp of one valve, while on another there may be subacute bacterial lesions. Recent observations have illustrated how the presence of the two types of lesions can be demonstrated on the same valve. Typical cases of subacute bacterial endocarditis cured by penicillin therapy have come to autopsy with death from other causes. The large villous vegetations were absent, and organisms could not be cultured from the blood or found in the valve by the Gram-Weigert stain. Within the valve, the inflammatory reaction was typically that of acute or recurrent rheumatic endocarditis.

Valves Involved.—The valvular involvement in acute rheumatic endocarditis and bacterial endocarditis is noted in Table IX. In either group,

the aortic and mitral are the only valves involved to any extent. The tricuspid alone and the pulmonary alone are seldom involved in the acute rheumatic type but are more frequently affected in the subacute bacterial.

brain 42 (11.5 per cent), kidneys and brain 7 (1.9 per cent) or a total of 256 (70.3 per cent). Embolic phenomena are not present with acute rheumatic endocarditis. Evidence of embolic processes is a dissimilar relationship.

TABLE IX. VALVE INVOLVEMENT IN ACUTE RHEUMATIC AND SUBACUTE BACTERIAL ENDOCARDITIS

	Valves														
Kinds	A	M	T	P	AM	AT	AP	AMT	AMP	AMTP	MT	MP	MTP	TP	Total
Acute Rheumatic	2	43	0	1	24	0	0	10	0	9	9	0	0	0	98
Subacute Bacterial	65	137	7	7	132	4	1	6	1	0	3	0	0	0	363
Total	67	180	7	8	156	4	1	16	1	9	12	0	0	0	461

TABLE X. COMBINATIONS OF VALVULAR INVOLVEMENT

Aortic alone, mitral alone, and aortic and mitral combined, per thousand autopsies in rheumatic heart disease and bacterial endocarditis

	Males					Females				
	No.	A	M	AM	Total	No.	A	M	AM	Total
Rheumatic	478	8.1	8.1	9.9	26.2	300	2.2	18.7	9.8	30.8
Subacute bacterial	217	3.0	3.8	5.0	11.9	111	1.4	6.0	3.9	11.4

TABLE XI. MYOCARDITIS IN ACUTE RHEUMATIC AND SUBACUTE BACTERIAL ENDOCARDITIS

	Aschoff nodules		Diffuse inflammation		Abscesses		Peri-arterial scars		One or more	
	No.	%	No.	%	No.	%	No.	%	No.	%
Acute rheumatic (295)	47	67.2	12	17.9	2	2.9	21	31.3	53	79.1
Subacute bacterial (60)	27	45.0	36	60.0	13	21.5	38	63.5	53	88.5

The relation of sex to the three kinds of valvular involvement (aortic alone, mitral alone and mitral and aortic combined) is of interest in showing a low aortic involvement and a high mitral involvement in the females (Table X). This is most pronounced in the rheumatic group, but it is definitely significant also in the subacute bacterial group. This anatomical relationship shows a marked similarity in the two groups.

Embolic Phenomena.—Evidences of embolic phenomena are common with subacute bacterial endocarditis. In 364 cases embolic phenomena were present as follows: spleen 72 (19.7 per cent), kidneys 22 (6 per cent), brain 14 (3.8 per cent), spleen and kidneys 88 (24.1 per cent), spleen and brain 11 (3.0 per cent), spleen, kidneys and

The Myocardium.—The various types of inflammation are seen in Table XI. The Aschoff nodule is less frequent in subacute bacterial endocarditis, 45 per cent, while in the acute rheumatic endocarditis it was present in 67.2 per cent of the cases. Von Glahn and Pappenheimer found the Aschoff nodule to be present in 46 per cent of the cases of subacute bacterial endocarditis which they studied. Abscesses are more common in the subacute bacterial type. Evidences of inflammation, acute or healed, occurred in 79.1 per cent of the acute rheumatic cases and in 88.5 per cent of the subacute bacterial cases.

Pericarditis.—The presence or absence of pericarditis has at times been used to differentiate acute rheumatic endocarditis from subacute bac-

terial endocarditis. Table XII shows the frequency of pericarditis in our cases of acute and recurrent rheumatic endocarditis, in healed rheumatic valvular deformities and in subacute bacterial endocarditis. Pericarditis is more frequent in the acute type of rheumatic endocarditis (41.5 per cent). This incidence does not represent the clinical incidence for the acute pericarditis evidently contributes largely as cause of death.

TABLE XII. FREQUENCY OF PERICARDITIS IN RHEUMATIC ENDOCARDITIS AND SUBACUTE BACTERIAL ENDOCARDITIS

	Number with pericarditis	Per cent
Acute and recurrent rheumatic endocarditis (183)	86	41.5
Healed valve deformities (671)	125	18.5
Total rheumatic (854)	211	24.7
Subacute bacterial endocarditis (364)	78	21.4

The frequency of pericarditis with the entire group of rheumatic hearts closely represents the clinical incidence of pericarditis with acute rheumatic endocarditis. It is obvious that in the cases of rheumatic valvular deformities there has been an acute rheumatic endocarditis. Evidently, in the cases of healed valve deformity in which there is no acute pericarditis or adherent pericardium, there never has been an acute pericarditis; for the type of pericarditis (fibrinous) which is associated with acute rheumatic fever undergoes organization early in its course, and permanent fibrous adhesions result. The incidence of pericarditis with the group of rheumatic hearts is 24.7 per cent, only slightly higher than the incidence with subacute bacterial endocarditis (21.4 per cent). Since the incidence of pericardial involvement in the total number of rheumatic heart disease cases represents closely the actual clinical incidence of pericarditis with acute rheumatic endocarditis, and since this incidence is nearly the same as the incidence of pericarditis in cases of subacute bacterial endocarditis, it appears obvious that the presence or absence of pericarditis cannot be used clinically to differentiate the two types.

Interpretations of the Relationships of Acute Rheumatic and Subacute Bacterial Endocarditis

The relationships are mostly similar with the following exceptions in the subacute bacterial type: the older age at which the endocarditis appears, the more severe clinical course, the greater ease with which organisms are recovered from the blood stream, the general absence of streptococcic allergy, the larger and infected thrombus on the valve and the embolic phenomena.

The first of these dissimilar relationships may possibly be explained by a difference of streptococcic hypersensitiveness in the two age groups. The remaining four differences may be accounted for by the effect of the large infected thrombus, the characteristic valvular lesion in subacute bacterial endocarditis.

From a study of the various relationships of the two types of endocarditis, two different theories have evolved:

1. The two types of endocarditis are different diseases.
   (a) A healed rheumatic valve becomes infected.
   (b) An acute rheumatic vegetation becomes infected with another infective agent.
2. They are the same disease etiologically, with different clinical and pathological manifestations.

Which or whether either of these two theories is correct has not yet been answered.

Summary

1. Rheumatic heart disease causes about 3 per cent of all deaths and 17.5 per cent of the cardiac deaths. Bacterial endocarditis causes about 1.5 per cent of all deaths and 10 per cent of cardiac deaths.

2. Approximately 90 per cent of the cases of subacute bacterial endocarditis have a rheumatic background.

3. From 25 to 30 per cent of patients with rheumatic heart disease finally die with subacute bacterial endocarditis.

4. Close clinical, bacteriological, immunological and anatomical relationships exist between rheumatic endocarditis and bacterial endocarditis.

5. The significance of these relationships has not been definitely determined in all cases.

6. It cannot be conclusively determined from human cases of endocarditis whether acute rheumatic endocarditis and subacute bacterial endo-

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VAGOTOMY FOR PEPTIC ULCER: A FOLLOW-UP STUDY OF TWENTY CASES

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THE object of the present paper is not to attempt to settle the current controversial and often inconsistent points of view on vagotomy for the treatment of peptic ulcer, but rather to present some data based on the study of the first twenty patients thus treated at the Asbury Hospital during the past two years. Because of the small number of cases and the short lapse of time, the data, as well as the few conclusions derived from them, are by no means decisive and final, and can only serve to provoke further argument on the efficacy of vagotomy for the treatment of peptic ulcer, an argument which, in all likelihood, will continue for many years to come. It has been said that discoveries in medicine are perennially made, discarded, forgotten, and then rediscovered, and their significance and values are finally established. This might very well be the case with vagotomy.

TABLE I. DISTRIBUTION OF AGE AT ONSET AND ON ADMISSION IN TWENTY PATIENTS

Decade	Onset	Admission
	No. of Patients	No. of Patients
1	1	
2	1	
3	7	
4	7	4
5	3	9
6	1	5
7		1
8		1
Average	31.2 yrs.	48.9 yrs.

The present series comprises twenty cases of vagotomy performed at the Asbury Hospital between February, 1946, and November, 1947. In this series there are seventeen males and three females, a ratio of about six to one. The distribution of age at onset of symptoms and on admission, and the duration of the peptic ulcer and of medical treatment are respectively illustrated in Tables I and II.

Nine of the twenty patients had a history of bleeding, and three of them of perforation, of whom two had a surgical closure. Of the series of twenty, seventeen had duodenal ulcer, one had gastric ulcer, and two had both. The operations

TABLE II. DURATION OF DISEASE AND OF MEDICAL TREATMENT IN TWENTY PATIENTS

Years	Since Appearance of Symptoms	Since Disease Diagnosed	Duration of Medical Treatment
1—5	2	7	10
6—10	4	6	7
11—15	5	4	3
16—20	3	1	
21—25	1	1	
26—30	2	1	
31—35	2		
36—40	1		
Average	16.7 yrs.	9.0 yrs.	5.6 yrs.

TABLE III. OPERATIONS FOR PEPTIC ULCERS

Surgeon	No. of Patients	Lesion	Operation
A	12	DU	TV
	1	DU	AV
B	1	DU	TV
C	1	DU	TV
	1	DU	AV GE
D	1	GU-DU	TV GR
E	1	GU-DU	AV GE
	1	GU	AV GE
F	1	DU	TV

DU—Duodenal Ulcer
GU—Gastric Ulcer
TV—Transthoracic Vagotomy
AV—Abdominal Vagotomy
GE—Gastroenterostomy
GR—Gastric Resection

were performed by six different surgeons designated as A, B, C, D, E and F, and lesions and operations are shown in Table III. Fifteen patients with duodenal ulcer including one having had a gastroenterostomy twenty-eight years previously and a revision of the gastroenterostomy twelve years ago, were treated by transthoracic vagotomy. One patient with duodenal ulcer was treated by abdominal vagotomy and another by abdominal vagotomy with gastroenterostomy. One patient with both duodenal and gastric ulcer was treated by abdominal vagotomy and gastroenterostomy, and another patient with both duodenal and gastric ulcer was treated by transthoracic vagotomy with a subsequent gastric resection and gastroenterostomy.

In the follow-up study, the patients were interviewed, x-rayed and asked to answer a question-

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naire, four to twenty-five months postoperatively. They were also asked to give their own opinions on the results of vagotomy for the treatment of their peptic ulcers. On the basis of the x-ray appearance of the stomach and duodenum preoperatively and postoperatively, the relief of symptoms, the presence of complications and the general well-being of the patient as a whole, the result in each case was then evaluated as will be illustrated later on.

X-Ray Studies

X-ray studies were made of the entire group of patients, ranging from two to twenty-four months subsequent to operation. Evidence of active duodenal ulcer, which was found on x-ray in seventeen patients before operation, was absent in all seventeen after vagotomy. The result from the x-ray viewpoint is therefore 100 per cent satisfactory. Deformity of the duodenal cap was as constant a feature after as before the operation, whereas irritability and spasm of the cap was present in five patients before but in none after vagotomy.

In the stomach, hypertrophic gastritis, which was encountered in eight patients preoperatively, disappeared after operation. A lesion at the pylorus, in the form of spasm, irregularity, deformity, adhesion or obstruction, was present in the three patients with gastric ulcer, and disappeared with the gastric ulcer after vagotomy and gastroenterostomy in two patients, but persisted with the gastric ulcer after simple vagotomy in the third. Another patient with a partially obstructed pylorus without ulcer showed deformity after simple vagotomy.

In the group with simple vagotomy, there is a tendency towards initial retention of secretion and food, delayed emptying, decreased tone, dilatation and reduced peristalsis postoperatively as compared with the gastric motility preoperatively. A decrease in gastric motility was apparent in five patients before, and was evident in thirteen patients after, simple vagotomy. In the group with vagotomy and gastroenterostomy, no such appreciable change was noted.

In five patients where more than one x-ray was made following simple vagotomy, there was a gradual improvement or return of the gastric motility, and in one patient the gastric motility which had been decreased before the operation resumed normally postoperatively.

TABLE IV. COMPARISON OF 12-HOUR GASTRIC NIGHT SECRETION

A.O.: 16 cases			P.O.: 6 cases			Follow-up: 3 cases		
Amount	Free Hcl	Total Hcl	Amount	Free Hcl	Total Hcl	Amount	Free Hcl	Total Hcl
670 c.c.	71	104	487 c.c.	12	39	497 c.c.	36	93

Figures represent average values in each group.

Gastric Acidity

The twelve-hour night secretion test for gastric acidity was not routinely carried out in all patients, and the technique of the test was not uniform. It was made in sixteen patients preoperatively and repeated in six patients immediately after simple vagotomy. A follow-up study was carried out in three patients from three to ten months postoperatively. The average figures of total secretion, free HCl and total HCl are indicated in Table IV. It is noted that hyperacidity which is present preoperatively tends to diminish postoperatively. This may be more than coincidental with the x-ray findings in which the gastric motility was decreased in those cases where a decreased acidity was present postoperatively.

The insulin test for gastric acidity, believed to be invaluable in ascertaining the completeness of the section of the vagus nerve, was done in only one patient in this series and is not included in the study. The results from the twelve-hour night secretion test performed in patients of the present series are a relative measure of acidity and are to be interpreted as such accordingly.

Relief of Symptoms

Although incomplete relief of symptoms in some patients and persistence of symptoms in a few were encountered, the relief of symptoms was, in general, definite. Seven patients had complete relief of their preoperative symptoms, whereas thirteen had incomplete relief or persistence of one or more of their original complaints. However, if the intensity, the frequency and the duration of these symptoms are considered, a marked improvement following operation was noted. The pain now is not as constant a feature as it used to be, and it does not affect the patients' daily activities nor interrupt their sleep. Gas, when present, can be easily eructed. In fact, except in two patients who are psychoneurotic, all these symptoms of pain, gas and belching, nausea

and vomiting, fullness and distress, when still present after vagotomy, are well under control so long as the patients do not indulge in dietary indiscretion.

Body Weight

The body weight of the twenty patients is compared before and after survey. The body weight at the time of follow-up, ranging from four to twenty-five months postoperatively, when compared with the minimal weight previous to surgery indicates that three show no change and seventeen show a gain of from 5 to 70 pounds. The average gain thus compared is 17.4 pounds. When compared with the usual weight previous to operation, four show no change, six show a loss of from 5 to 25 pounds, and ten show a gain of from 5 to 20 pounds. The average gain thus compared is 2.8 pounds. It is noted that patients who were overweight from the effects of the ulcer diets were able to reduce to normal weight and that underweight patients were able to eat normally and gain weight after vagotomy.

Diet

According to the tolerance of various foods, the patients are divided into four groups. Those who could tolerate only a strict diet before the operation but can enjoy a liberal diet after operation belong to Group I. There are five patients in this group. Those who could tolerate a limited diet before, but can enjoy a liberal diet after surgery are classified as Group II. There are three patients in this group. In Group III are four patients who could only tolerate a strict diet before but can enjoy a moderate diet after surgery. In Group IV are seven patients who could tolerate a limited diet before but can tolerate a moderate diet after operation. In one patient no change is observed after operation.

Tobacco could not be tolerated before, but is tolerated well or in moderation after operation in four patients. The same is observed in the case of alcohol. Two patients show no improvement in the tolerance of tobacco and alcohol postoperatively.

Activities

In seventeen of the twenty patients the daily activities were interrupted with a variable amount of work loss attributed to the ulcer before operation. Postoperatively, fourteen have been able to resume their normal activities without any loss of work, and three were still doing light work at the time of the follow-up. Of the remaining three patients, one was feeling weak and tired and thought that age was against him. One was as anemic and listless as before, and was later found to have a cancer of the uterus. One who never let his ulcer interfere with his work, but had to spend from $600 ao $1,200 a year for medical care for five years previous to operation, has been working in a fuller capacity since the operation.

Psychic Factor

Fourteen of the patients indicate that they are nervous and high-strung individuals with excessive stress and strain and undue worries and excitements. Their own expressions are "discontented childhood," "dissatisfied home life," "things made me sick," "disappointed in love," et cetera. Seven patients of this group showed improvement after operation, and described their improvement as "full of pep," "with ambition never had before," "feel like a new person," "life's worth living," "never worry about things that can't be helped." Two psychoneurotic patients, both with an intestinal disorder, were skeptical about the results of vagotomy. One of them is now much improved after some psychotherapy, but the other, who has been informed of the inadvisability of vagotomy by one doctor and advised to have a gastroenterostomy by another, still has a number of indefinite complaints. One patient who does not belong to this group stated that while on a strict milk diet during a bad attack of ulcer, the news of his father's death brought about a severe attack of pain and bleeding so that he was confined to bed for two weeks. Another patient who also does not belong to this group recalled that the onset of his illness was preceded by a fight with a business associate. The incident occurred at a time after his wife had just had an operation. One patient belonging to the group of fourteen found no relief of his nervous condition after twelve months and doubted whether vagotomy is beneficial in nervous conditions.

Surgical Morbidity and Complications

There is no mortality in this series, and the results in general are satisfactory. Regardless of the type of operation performed, the postoperative stay in the hospital was about ten days on the

TABLE V. GASTRO-VISCERAL AND OTHER COMPLICATIONS IN TWENTY PATIENTS

Patient's Symptoms	T.V./A.V.	A.V.-G.E.
Diarrhea	7	0
Belching	3	1
Incisional Pains	3	0
Abdominal Pains	3	0
Numbness	3	0
Fullness	1	1
Distress	1	0

TV—Transthoracic Vagotomy
AV—Abdominal Vagotomy
GE—Gastroenterostomy

average. The patients were usually allowed up on the third day and were allowed a diet on the fourth postoperative day.

Pulmonary complications, in the form of pleurisy, pneumothorax, emphysema, atelectasis and pleural thickening, only occurred following simple vagotomy and were present clinically in ten patients. In the x-ray follow-up of the series, pleural thickening was found in fourteen patients. By comparing the results observed clinically and those from x-ray follow-up, it is noted that some of these complications were detected clinically only, some in the x-ray only, and some both clinically and in the x-ray, totally in sixteen patients.

In Table V the gastrovisceral and other complications are listed. Diarrhea, which probably develops from an imbalance between the sympathetic and parasympathetic nervous systems, appeared in seven patients, and was relieved in five after a period of two to three months postoperatively, but had persisted off and on in two patients up to eleven months and fourteen months, respectively, when last interviewed. One of the latter two patients is a psychoneurotic previously mentioned. Abdominal pain developed in three patients, two of whom are the psychoneurotics. Incisional pain was encountered in three patients, the severest up to three months postoperatively. Belching was found in four patients, but was considered by all except one as a relief of the gas which they used to have. There were, in addition, three cases of numbness, two cases of fullness and one case of distress. The gastrovisceral and other complications, in one or more forms, therefore developed in fourteen (70 per cent) of the patients, including the two with psychoneurosis. It is noted, however, that all these complications are generally not severe enough to cause much discomfort. They are transitory and have a tendency to disappear in the course of time.

Résumé of Illustrative Cases

Case 1.—DW 48F. Gas pain, vomiting, fullness for forty years. Duodenal ulcer diagnosed for twenty-two years. Medical treatment for two years. X-ray: Active duodenal ulcer, cap deformity. Transthoracic vagotomy on 2-23-46. X-ray, one month: Stomach with moderate retention. Cap deformity without active duodenal ulcer. Twenty-three months: Stomach with minimal retention, 40 per cent emptying at four hours, moderate dilatation, shallow peristalsis. Cap deformity without active duodenal ulcer. Pleural thickening. Follow-up, twenty-five months: Some gas, fullness occasionally. Incisional pain one to two months. Feeling well in general.

Case 2.—IB 43M. Gas pain, constipation for seven years. Duodenal ulcer diagnosed for two years. Medical treatment for two years. History of bleeding. Psychoneurosis. Irritable colon. Prejudiced against medical treatment. X-ray: Active duodenal ulcer, cap deformity. Hypertrophic gastritis, eccentrically placed pylorus. Transthoracic vagotomy on 5-18-46. X-ray, twenty-two months: Stomach with retention, 100 per cent emptying at four hours, slight dilatation. Cap deformity without active duodenal ulcer. Pleural thickening. Follow-up, twenty-two months: Some gas pain, belching, pain in right lower quadrant, persistent constipation. Feeling better after psychotherapy.

Case 3.—AB 61M. Gas pain, distress for thirty-two years. Duodenal ulcer diagnosed for twenty-eight years. Medical treatment for ten years. Gastroenterostomy twenty-eight years ago. Revision of gastroenterostomy twelve years ago. Bleeding in 1935. X-ray: Active duodenal ulcer, cap deformity, irritability, spasm. Nonfunctioning gastroenterostomy. Transthoracic vagotomy on 6-21-47. X-ray, four months: Stomach with 70 per cent emptying at four hours. Cap deformity without active duodenal ulcer: Nine months: Stomach with slight retention; 85 per cent emptying at four hours; tone good. Cap deformity without active duodenal ulcer. Follow-up, nine months: Some gas pain, distress, belching, diarrhea occasionally. Constipation.

Case 4.—RL 42M. Gas pains for eleven years. Duodenal ulcer diagnosed for two years. Medical treatment for one year. History of bleeding. X-ray: Active duodenal ulcer. Hypertrophic gastritis. Abdominal vagotomy on 11-7-47. X-ray, two months: Stomach with retention, 10 per cent emptying at four hours, atonic, slightly dilated, peristalsis weak. Cap deformity without active duodenal ulcer. Pleural thickening. Follow-up, four months: Some gas pain, belching, diarrhea. Feeling well in general.

Case 5.—BT 51M. Pain for thirty years. Duodenal ulcer diagnosed for one year. Medical treatment for one year. X-ray: Active duodenal ulcer, cap deformity.

TABLE VI. SUMMARY OF RESULTS

	Patient	Sex	Age at Onset	Age on Admission	Duration of Symptoms (Yrs.)	Duration Since Diagnosis (Yrs.)	Duration of Medical Treatment (Yrs.)	Bleeding	Perforation	Lesion	Previous Operation	Type of Vagotomy	Duration of Vagotomy (Mo.)	Subsequent Operation	Result According to Patient	Result According to Evaluation
1.	DW	F	8	48	40	22	2	—	—	DU		TV	25		Excellent	Good
2.	AH	M	31	49	18	12	12	—	—	DU		TV	24		Good	Good
3.	IB	M	36	43	7	2	2	+	—	DU		TV	22		Fair	Good
4.	OP	M	21	47	26	14	14	+	+	DU	SC	TV	22		Excellent	Good
5.	KP	M	26	33	6	6	6	—	—	DU		TV	20		Good	Excellent
6.	AP	M	25	37	12	12	12	—	—	DU		TV	19		Excellent	Excellent
7.	JR	M	25	56	31	7	7	—	+	DU		TV	18		Excellent	Excellent
8.	GB	M	43	53	10	10	6	—	—	DU		TV	14		Fair	Fair
9.	AJ	F	31	34	3	2	2	—	—	DU		TV	13		Good	Excellent
10.	HM	M	41	41	(I)	(1)	(1)	+	—	DU		TV	12		Good	Good
11.	HMc	M	29	44	15	15	10	—	—	DU		TV	12		Fair	Good
12.	AB	M	29	61	32	28	10	+	—	DU	GE	TV	9		Good	Good
13.	RL	M	31	42	11	2	1	+	—	DU		AV	4		Excellent	Good
14.	CM	M	23	40	17	17	10	+	—	DU		TV	22		Good	Excellent
15.	OS	M	32	57	25	1	1	+	—	DU		TV	15		Excellent	Excellent
16.	BT	M	20	51	30	1	1	—	—	DU		AV GE	10		Good	Good
17.	JK	M	40	54	14	4	2	—	—	DU GU		TV	13	GR GE	Excellent	Poor
18.	AS	M	52	71	19	8	1	—	+	GU	SC	AV GE	12		Excellent	Excellent
19.	WG	F	38	50	12	10	10	+	—	DU GU		AV GE	11		Excellent	Excellent
20.	DH	M	41	47	6	6	3	+	—	DU		TV	11		Fair	Fair

DU—Duodenal Ulcer
GU—Gastric Ulcer
SC—Surgical Closure
GR—Gastric Resection

TV—Transthoracic Vagotomy
GE—Gastroenterostomy
AV—Abdominal Vagotomy

Abdominal vagotomy with gastroenterostomy on 5-17-47. X-ray, ten months: Stomach with normal emptying at four hours, no dilatation. Cap deformity without active duodenal ulcer. Follow-up, ten months: Some belching, fullness.

Case 6.—JK 54M. Pain, nausea for fourteen years. Duodenal and gastric ulcer diagnosed for four years. Medical treatment for two years. X-ray: Active duodenal ulcer, cap deformity. Prepyloric ulcer, pyloric spasm. Transthoracic vagotomy on 2-20-47. X-ray, four months: Stomach with retention, 1 per cent emptying at four hours, atonic, pylorus with complete mechanical obstruction. Eleven months: Stomach with retention, 40 per cent emptying at four hours, tone good, peristalsis very shallow. Twelve months: Stomach with 50 per cent emptying at six hours, peristalsis shallow, pylorus irregular, gastric ulcer. Cap deformity without active duodenal ulcer. Pleural thickening. Follow-up, twelve months: Some pain, persistent nausea, vomiting, diarrhea, fullness, distress. Gastric resection on 2-11-48. Prepyloric ulcer found perforated. Feeling well since.

Case 7.—AS 71M. Pain, distress for nineteen years. Gastric ulcer diagnosed for eight years. Medical treatment for one year. Perforation in 1945 with surgical closure. X-ray: Gastric ulcer on lesser curvature, hypertrophic gastritis, pyloric spasm, marked retention with 10 per cent emptying at four hours. Cap deformity without active duodenal ulcer. Abdominal vagotomy with gastroenterostomy on 4-2-47. X-ray, ten months: Stomach with 90-95 per cent emptying at four hours, slight dilatation. Gastroenterostomy functioning well. Follow-up, ten months: Feeling well.

Summary and Conclusions

The entire series consists of twenty patients studied from four to twenty-five months postoperatively. On the basis of x-ray evidence of healing of the ulcer and gastric motility, the relief of symptoms, the development of gastrovisceral complications and the general well-being of the patient as a whole, the result in each patient is estimated as excellent, good, fair or poor. The x-ray findings of the stomach and duodenum were found, on the whole, to correspond closely to the patient's state of health, and these objective findings are therefore taken as more reliable criteria in the evaluation of the results. On the other hand, the psychic factor in peptic ulcer plays just as important a role as in other diseases. How the patient himself feels before and after operation therefore deserves due consideration.

In fifteen patients with duodenal ulcer preceding transthoracic vagotomy, the results were excellent in six, good in seven and fair in two. One of these patients with a previous gastroenterostomy and a revision of the gastroenterostomy, which was nonfunctioning at the time of his admission for vagotomy, has a good result after

the operation. In two patients with psychoneurosis the result was good in one and fair in the other. One patient with duodenal ulcer was treated by abdominal vagotomy and another by abdominal vagotomy with gastroenterostomy. The results were good in both instances.

Abdominal vagotomy together with gastroenterostomy was performed on two patients, one with gastric ulcer and the other with both gastric and duodenal ulcer. The results in both cases were excellent, but the indication for vagotomy is questionable. Transthoracic vagotomy was performed on another patient with both gastric and duodenal ulcer. The result was poor. A prepyloric ulcer which had perforated was found during a subsequent gastric resection.

From the study of this series, it is evident that vagotomy is indicated in duodenal ulcer, and the results are favorable. On the whole, the surgical morbidity is low. The ulcer heals readily, and no subsequent operation is usually necessary. The relief of symptoms is definite. A more liberal diet is tolerated and the resumption of normal daily activities follows.

The incidence of pulmonary and gastrovisceral complications is high. But, as far as could be determined, they seem to be of no serious import and tend to disappear in the course of time.

Vagotomy is contraindicated in gastric ulcer because of the possibility of malignancy and perforation.

Acknowledgment

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References

1. Boles, R. S.: Treatment of peptic ulcer. J.A.M.A., 136: 528, (Feb.) 1948.
2. Crile, G., Jr.: Subdiaphragmatic vagotomy; indications and technic. Cleveland Clin. Quart., 14:65, (April) 1947.
3. Dragstedt, L. R.: Section of vagus nerves to the stomach in the treatment of gastro-duodenal ulcer. Minnesota Med., 29:597, (June) 1946.
4. Hollander, F.: Are gastric ulcer and duodenal ulcer different diseases? S. Clin. North America, 27:265, (April) 1947.
5. Moore, F. D.; Chapman, W. P.; Schultz, M. D., and Jones, C. M.: Resection of vagus nerves. J.A.M.A., 113:741, (March) 1947.
6. Moses, W. R.: Critique on vagotomy. New England J. Med., 237:603, (Oct.) 1947.
7. Smith, R. C.; Ruffin, J. M., and Baylin, G. J.: The effect of transthoracic vagus resection upon patient with peptic ulcer. South. M. J., 40:1, (Jan.) 1947.
8. Thorek, P.: Vagotomy. J.A.M.A., 135:1141, (Dec.) 1947.
9. Walters, W.: Neibling, H. A.; Bradley, W. F.; Small, J. T., and Wilson, J. W.: Favorable and unfavorable results of gastric neurectomy for peptic ulcer; an anotomic, physiologic and clinical study. S. Clin, North America, 27: 885, (Aug.) 1947.
10. Weinstein, V. A., and Colp, R.: Supradiaphragmatic vagotomy in gastrojejunal ulceration following subtotal gastrectomy for duodenal ulcer. S. Clin. North America, 27:249, (April) 1947.
11. Winkelstein, A.: The significance of the gastric acidity in the surgical therapy of peptic ulcer. S. Clin. North America, 27:255, (April) 1947.

RHEUMATIC AND BACTERIAL ENDOCARDITIS

(Continued from Page 1099)

carditis are two separate diseases occurring together in approximately 90 per cent of the cases of subacute bacterial endocarditis, or whether they are different manifestations of one disease.

References

1. Birkhaug, K. E.: Rheumatic fever; allergic reactions with toxin-producing strains of nonmethemoglobin-forming streptococcus isolated from rheumatic fever. J. Infec. Dis., 43: 280, 1928.
2. Christian, H. A.: Determinative background of subacute bacterial endocarditis. Am. J. Med. Sc., 201:34, 1941.
3. Clawson, B. J., and Wetherby, M.: An experimental basis for intravenous vaccine therapy in chronic arthritis. Ann. Int. Med., 5:1447, 1932.
4. Clawson, B. J., and Bell, E. T.: Comparison of acute rheumatic and subacute bacterial endocarditis. Arch. Int. Med., 37:66, 1926.
5. Cohn, A. E., and Lingg, C.: The natural history of rheumatic cardiac disease. J.A.M.A., 121:1, 1943.
6. Favour, C. B., Janeway, C. A., Gibson, J. G., and Levine, S. A.: Progress in the treatment of subacute bacterial endocarditis. New Eng. J. Med., 234:71, 1946.
7. Gelfman, R.: Incidence of acute and subacute bacterial endocarditis in rheumatic heart disease. Ann. Int. Med., 19:253, 1943.
8. Gibson, H. J., Thomson, W. A. R., and Stewart, D.: Hemolytic streptococcus as a factor in causation of acute rheumatism. Arch. Dis. Childhood, 8:57, 1933.
9. Jones, T. D.: Etiology of rheumatic fever. J. Pediat., 15: 772, 1939.
10. Swift, H. F.: Bacterial allergy (hyperergy) to nonhemolytic streptococci in its relation to rheumatic fever. J.A.M.A., 90: 906, 1928.
11. Von Glahn, W. C., and Pappenheimer, A. M.: Relationship between rheumatic and subacute bacterial endocarditis. Arch. Int. Med., 55:173, 1935.
12. Winblad, S.: Studies in hemolytic streptococci with particular reference to rheumatic fever. Acta path. et microbiol., Scandinav. supp., 44:199, 1941.

CLINICAL-PATHOLOGICAL CONFERENCE

DIAGNOSTIC CASE STUDY
With Literature Review

HAROLD H. JOFFE, M.D., and ARTHUR H. WELLS, M.D.

Duluth, Minnesota

DR. A. H. WELLS: We wish to present a difficult diagnostic problem for your careful consideration. Then, Dr. Joffe will briefly review four additional cases of the disease found in our hospital records and summarize the literature on the subject.

DR. C. H. MEAD: (Case No. 43235) This woman, a business school instructor, was admitted to the hospital at the age of twenty-two on December 15, 1936, because of right lower quadrant pain of two years' duration, with loss of appetite, diarrhea and 5-pound weight loss during the previous two months. In addition, she complained of daily frontal headaches, occasional scotomata and frequent upper respiratory infections. Physical examination at that time was essentially negative. Urinalyses showed nothing unusual. Hemoglobin determination, red blood cell count, white blood cell count and differential count were not done. A preoperative diagnosis of recurrent appendicitis was made and on December 16, 1936, an exploratory laparotomy was performed, at which time a cholecystectomy and appendectomy was done. Pathologic studies revealed cholelithiasis, chronic cholecystitis and a normal appendix.

The patient was again admitted on June 4, 1948, with a history of crampy right lower quadrant pain, malaise, and diarrhea which had persisted since her operation in 1936. The foregoing symptoms had been gradually becoming more severe with four to five bowel movements daily and a weight loss of approximately 6 pounds since January of 1948. Only on one occasion, Christmas of 1947, did she notice some blood in the stools. In addition, she complained of occasional difficulty in swallowing, dizzy spells, and some backache. The patient appeared to be emotionally immature, living with two sisters and one brother, all older than herself and all unmarried.

Physical examination revealed a slight fever of 99.2 degrees, with mild but diffuse tenderness on deep palpation of the right lower quadrant. Urinalyses were essentially negative. The hemoglobin was 11.5 grams, with a red blood cell count of 4,060,000. The white blood cell count was 14,700 with 76 per cent neutrophiles. The sedimentation rate (Westergren) was 77 mm. per hour. The Kline test was negative. A chest plate revealed nothing unusual. An intravenous pyelogram revealed a reduplication of the left kidney pelvis and the proximal end of the ureter, with moderate ptosis of the right kidney. A barium enema, with films made during fluoroscopy as well as before and after evacuation of the enema, revealed the barium to pass through the entire colon. The terminal ileum was not visualized at this time. There was a localized, persistant deformity of the cecum in the region of the ileocecal valve (Fig. 1). There also appeared to be a distortion and deformity in the mucous membrane pattern. Films made four and six hours later seemed to indicate that the terminal ileum was reasonably normal. An upper gastrointestinal series revealed nothing unusual. The roentgenologist concluded that the deformity in the region of the cecum was probable carcinoma.

Fig. 1. Print of roentgenograph showing defect in cecum.

DR. A. H. WELLS: The case is now open for diagnoses.

PHYSICIANS: Carcinoma of the cecum, actinomycosis of the appendix and cecum, tuberculosis of the cecum, amebic granuloma, ulcerative colitis, regional ileocolitis and pelvic tumor.

From the Department of Pathology and Intern Training Program, St. Luke's Hospital, Duluth, Minnesota.

DR. A. H. WELLS: Dr. Moses Barron is right. This is a case of regional enteritis. What led you to make this diagnosis?

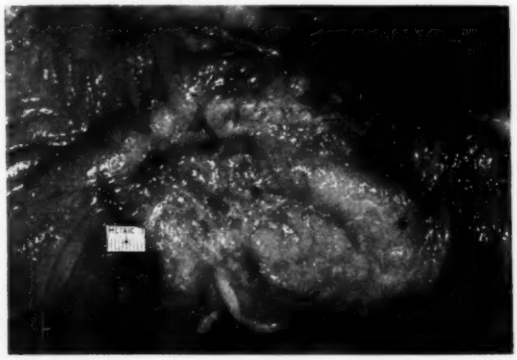

Fig. 2. Mucosal surfaces of terminal ilium and adjacent cecum.

DR. M. BARRON: Carcinoma is very unlikely because of the twelve-year history of symptoms. Actinomycosis and tuberculosis are possibilities, but the course of the disease does not fit either one. The patient's age and duration of such symptoms as lower abdominal cramps, diarrhea, weight loss and anemia points to a diagnosis of regional enteritis.

DR. C. H. MEAD: The patient was prepared for operation, which was performed on June 24, 1948, at which time a resection of the terminal ileum, cecum and a portion of the ascending colon was performed. The patient appears to be cured to date.

DR. A. H. WELLS: The specimen consisted of a segment of terminal ileum, measuring 14 cm. in length, and a 13 cm. segment of ascending colon with the cecum (Fig. 2). There was a diffuse hard, rubbery, thickening of the wall in the terminal ileum, beginning 5.5 cm. from the ileocecal valve and extending onto the cecum to involve the adjacent 3 cm. of the latter. The mucosa of the involved terminal ileum and the cecum had a roughened heaped-up, cobblestone appearance with no evidence of ulceration or tumor masses. The attached mesentery revealed several firm lymph nodes measuring from 0.3 up to 0.9 cm. in diameter.

The microscopic examination revealed almost complete destruction of the mucosal glands of the ileum, which were replaced by very cellular and congested, vascular scar tissue with dense lymphocytic, plasma cell and neutrophilic infiltration in all layers (Fig. 3). There was some hypertrophy of the mucosal glands in the cecum with no evidence of malignancy. Sections from the lymph nodes revealed both acute and chronic inflammatory changes. A diagnosis of regional enterocolitis was made.

Discussion

DR. H. H. JOFFE: We wish to present briefly four additional cases out of 93,145 admissions to this hospital from January 1, 1936, to August 1, 1948. These cases beautifully illustrate the difficulty in differentiating regional enteritis from acute appendicitis, intestinal obstruction and ulcerative colitis.

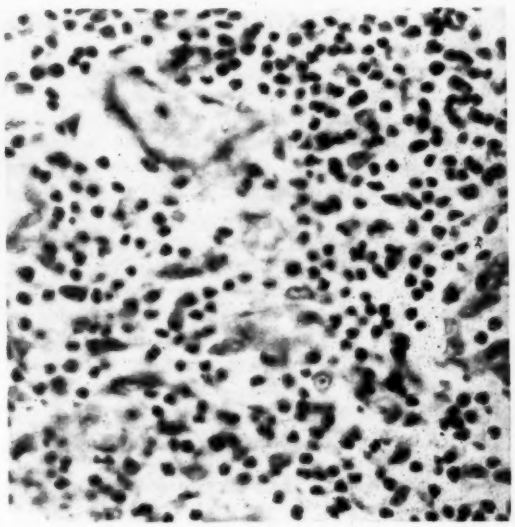

Fig. 3. Photomicrograph of nonspecific vascular granulation tissue in mucosa of ilium.

Case No. 39068.—A twenty-one-year-old waitress with a history of intermittent crampy upper abdominal pain and malaise for five weeks duration was placed on an ulcer regime with some relief of symptoms for a few days. While on her way to work one morning, she was seized with severe abdominal pain radiating into the right lower quadrant. There was also giddiness, weakness, nausea, vomiting and profuse perspiration.

Physical examination revealed diffuse tenderness and rebound tenderness in the right lower quadrant. There was a slight fever of 99.6° F. The hemoglobin was 11.5 grams, with a red blood cell count of 4,370,000. The white blood cell count was 27,250 with 90 per cent neutrophiles. The urinalysis was negative.

A laparotomy for acute appendicitis was performed. The appendix was found to be normal and was not removed. A remarkably thickened, firm terminal ileum was resected with an end-to-end anastomosis. There has been no recurrences of regional enteritis after one year and three months.

Case No. 43074.—This twenty-two-year-old woman gave a history of crampy intermittent abdominal pain, weight loss of 30 pounds and diarrhea amounting to five bowel movements a day, all of a year's duration. There was occasional vomiting, and one evening she experienced sharp lower abdominal pain, nausea and vomiting, and over a period of five days there was no passage of fecal material.

Physical examination revealed an emaciated female with visible peristaltic waves in the upper abdomen.

There was moderate generalized rigidity and marked tenderness and rebound tenderness. There were no palpable masses. The hemoglobin was 11.5 grams with a red blood cell count of 4,620,000. The white blood cell count was 14,750 with 81 per cent neutrophiles. The urinalysis was negative.

An ileocolostomy was done because of the patient's poor condition. There was a cicatricial mass in the lower ileum with proximal dilated viable bowel and no "skip areas." A resection with an end-to-end anastomosis was done at a later date. The patient has now been free of symptoms for two and a half months.

Case No. 40796.—This thirty-eight-year-old man gave a history of episodes of diarrhea and lower abdominal crampy pain for five years duration. The episodes of diarrhea occurred about three times a week with ten to twelve stools daily, but there was never any blood or mucus. There had been an appendectomy several years before.

Physical examination revealed tenderness in the right lower quadrant with a fever of 99.8° F. There was no anemia. The white blood cell count was 14,950 with 77 per cent neutrophiles, and the sedimentation rate was 49 mm. per hour (Westergren). The urinalysis was negative. A chest plate was negative and a gastrointestinal x-ray study led to the conclusion of regional enteritis involving the terminal ileum.

A short circuiting procedure was done, with a resection at a later date. The patient has been free of symptoms for nine months.

Case No. 17493.—This fourteen-year-old girl gave a history of diarrhea with several bowel movements during the day and night for the past three months. There was loss of appetite with a loss of 15 pounds in weight. Two months prior to admission there were episodes of vomiting which occurred two to three times a week, usually after meals. One day prior to admission she experienced cramp-like upper abdominal pain which was located to the left of the umbilicus.

Physical examination revealed an undernourished and dehydrated girl, with abdominal distension and tenderness to the left and slightly below the navel. There was no fever or anemia. The white blood cell count ranged up to 13,300 with 88 per cent lymphocytes. Stool examinations revealed no ova, parasites or acid fast bacilli. There was, however, 1 to 2 plus occult blood with moderate numbers of pus cells and mucus. The urinalyses were negative. A chest plate was interpreted as negative, and a gastrointestinal series revealed a negative colon and terminal ileum.

The patient was closely observed for several days, and an exploratory laparotomy was done with a resection of the terminal ileum and a lateral anastomosis. There has been no recurrence of symptoms for twelve years and four months.

Terminology and Etiology

DR. H. H. JOFFE: The nomenclature is confused by such multiplicity of terms as regional ileitis, regional enteritis, terminal ileitis, acute and chronic ulcerative ileitis, phlegmon of the ileum, nonspecific ileocolitis, chronic interstitial enteritis, ileocecal pseudotumor, infective granuloma, sclerosing and stenosing ileitis, nonspecific intestinal granuloma, Crohn's disease, cicatrizing enteritis and a host of others. The term regional enteritis has been accepted widely for many years and is nonspecific as to location and etiology, all desirable features for general acceptance until the etiology is known.

A lack of knowledge of the causative factor is essential to a diagnosis of this clinical entity.[30] Practically all types of agents have been incriminated, such as: B. coli,[19,34] B. dysenteria,[40] anaerobic streptococci,[35] Aerobacteria aerogenes,[25] tubercle bacillus,[40] Mycobacterium Johnei,[51] bacterial toxins,[20] viruses,[48] Entamoeba histolytica,[11] parasites,[2] achylia gastrica,[40] allergy,[32] trauma,[33] nonspecific inflammation of the appendix,[41] impairment of blood supply[5] and interference with the lymphatic supply.[42] In spite of the heterogenous group of agents, no specific organism or single etiological factor has yet been recognized.[4,40]

Incidence, Sex and Age

Brown and Donald[6] reported a total of 178 cases seen at the Mayo Clinic between 1922 and 1940 with 114 cases in the four-year period between 1937 and 1940. Fallis[21] found one case in 195,000 admissions to the Henry Ford Hospital during the fifteen-year period prior to January 1, 1933, and thirty-two cases out of 180,000 new patients during the ten-year period between 1933 and 1943. The foregoing signifies either an increase in the incidence of the disease or perhaps a sharper clinical recognition.

The disease affects principally young adults with approximately equal sex distribution in two large series[6,34] totaling 233 cases. However, in a review[40] of 393 cases in the literature, 56.6 per cent were males and 43.5 per cent were females. By combining two large series[6,34] totaling 233 cases, we find 78.1 per cent occurred under forty years of age, which closely corresponds with 79 per cent in another review of 382 cases in the literature.[40]

Pathology

The pathologic changes vary with the stage of the disease. They consist primarily of ulcerative, exudative and proliferative inflammatory stages resulting in a cicatrizing granuloma with obstruction or fistula formation.[1,3,4,7,12,14,28,34,37,39,45,46,47]

In the early stage of the disease, the segment of bowel is hyperemic and swollen. The serosa is blotchy or granular, bleeds easily, and may be covered with a plastic fibrinous exudate. The mesentery is likewise edematous, thickened and inflamed, with enlargement of lymph nodes which may form various sized tumor masses. Areas of normal bowel between sharply defined diseased segments, the so-called "skip areas," may be present. The mucosa reveals ulcerations which are usually located along the mesenteric border and lie in the long axis of the intestines.[14,39,46,47] As the disease progresses, the submocosa and, to a lesser extent, the muscularis are the seat of marked inflammatory, hyperplastic and exudative changes, with edema, fibrosis and lymphocytic

infiltration which result in an enormous thickening of the bowel wall, producing a rubber hose consistency. These changes are finally replaced by a fibrostenotic process, with narrowing of the lumen and dilatation of the proximal segment of the bowel. The serosa may exhibit tubercle-nodule-like structures which are often mistaken for tuberculosis. These lesions are described by Warren and Sommers[49] as being diagnostic and are found in the mesentery, lymph nodes and liver as well as throughout the involved segment of gut wall. The mesentery of the affected segment is greatly thickened and fibrotic. The mucosal ulcerations tend to perforate with resultant abscesses and fistula formation.[1,7,12,14,28,37,39,46,47] The latter may communicate internally with adherent loops of bowel or bladder, or externally with the skin surface through the abdominal wall, or any combination may result.[39]

There are no specific microscopic features in the various stages except varying degrees of acute and chronic inflammation with variations in the predominence of neutrophiles, lymphocytes, mononuclear cells, plasma cells and fibrocytes. In the earlier stage, the lesion is more diffuse, involving mainly the mucosa and submucosa. In the latter stages the inflammatory reaction is more focal in character. The presence of giant cells is quite striking in some cases and is probably responsible for the erroneous diagnosis of tuberculosis.[14]

The terminal ileum is by far the favorite site of involvement, but any part of the bowel from the jejunum to the sigmoid may be affected. In one series[50] of 131 cases, 75 per cent involved the terminal ileum, while in another series[6] of 178 cases, the lower part of the ileum with extension into the colon constituted 92 per cent of the cases. In a review of the literature[40] totaling 462 cases, the terminal ileum was involved alone or with extension into the cecum and ascending colon in 79.6 per cent of cases. On rare occasions the lesions are found in the jejunum, cecum, and ascending and transverse colon alone or in combination with involvement of the ileum.

Symptoms and Signs

The clinical picture may be divided into four stages: (1) acute, (2) irritative,[31,39] (3) obstructive and (4) fistula.[3,4,12,14,15,21,47] The acute stage is often diagnosed as appendicitis because of right lower quadrant pain and tenderness, nausea, vomiting, fever and leukocytosis. In two series[9,28] totaling ninety-four cases, a previous appendectomy had been performed in 40 per cent of cases. In the irritative stage, the symptoms of crampy diarrhea, with blood and mucus in the stool, frequent attacks of colic, low grade fever, anemia, inanition and weight loss, simulate ulcerative colitis and may be present over a long period of time. Not infrequently, a boggy abdominal mass can be palpated in the right lower quadrant.[39] Remissions are rather common in the first two stages.[3] As the fibrostenotic process increases, the symptoms of severe abdominal cramps, borborygmi, distension with an increase in the severity of the anemia and more prounounced weight loss, complete the clinical picture of the third or obstructive stage. Complete obstruction is rare, but obstructive phenomena are present at some time during the course of the disease in about one third of the cases.[21] Dickinson and Zimmerman,[15] however, reported a case of acute intestinal obstruction in the absence of any antecedent history of abdominal disease. The fourth or intractable fistula stage is often referred to as a sequela or complication.

In an attempt to summarize the frequency of the various symptoms, we have taken the liberty of combining four series[9,28,30,44] totaling 256 cases, with the results found in Table I.

TABLE I. SYMPTOMS

Symptom	*Number*	*Percentage*
Abdominal pain	212	82.8
Weight loss	186	73.4
Diarrhea	143	55.8
Fever	139	54.3
Palpable abdominal mass	127	49.0
Anemia	104	40.6
Fistulas	64	25.0

The duration of symptoms varies greatly, and in a series[44] of 55 cases, varied from one month to fifteen years, with 52.7 per cent having had symptoms for less than one year.

Diagnosis

The diagnosis of regional enteritis can only be made by a thorough investigation of the gastrointestinal tract.[7] The symptoms of recurrent attacks of abdominal pain, diarrhea, weight loss, chronic partial intestinal obstruction, accompanied by a persistent low grade fever and anemia, especially in young individuals, are strong clinical proof.[24,46] Roentgenologic studies can usually confirm the clinical diagnosis and are repeatedly referred to as the most important single diagnostic aid.[6,7,8,12,28,29,31,39,46,47] In one series[6] totaling 178 cases, a barium enema revealed evidence of the disease in 124 cases, with seven additional cases diagnosed by a barium meal for a total of 131 (74 per cent).

Kantor[29] states that the following are the chief roentgenologic signs:

1. A constant filling defect in the ileum just proximal to the cecum.
2. An abnormality in the contour of the last filled loop of ileum.
3. Dilatation of the ileac loops just proximal to the lesion.
4. The presence of the "string sign" which appears as a thin slightly irregular linear cotton string like shadow, extending from the region of the last visualized loop of ileum through the entire extent of the filling defect and ending at the ileocecal valve.

The "string-sign" of Kantor, though characteristic, is not pathognomonic and may be present in other stenosing processes.

Regional enteritis is often confused with and must be differentiated from appendicitis, tuberculous enteritis, ulcerative colitis, amebiasis, bacillary dysentery, diverticulitis, Meckel's diverticulum, neoplasm of the ileum, sprue, parasitic infections, actinomycosis, syphilis, car-

cinoma and lymphoblastoma.[1,7,8,12,14,16,28,31,34,38,39,40,46] A carefully taken history and a thorough physical examination, aided by roentgenographic studies, sigmoidoscopic examination and laboratory tests, will usually result in a correct diagnosis.

Treatment

The method of treatment varies somewhat with the stage of the disease. In the presence of an acute process or exacerbation it is unwise to institute any operative procedure unless there is obstruction.[1,39,47] In the acute stage the diagnosis is often made by abdominal exploration because of the mistaken diagnosis of acute appendicitis. In such cases, if the appendix is not involved, it should not be removed because of the danger of fistula formation.[38] Medical management has little to offer in the more chronic forms and operation is the accepted treatment of choice if a cure is to be expected.[1,6,7,12,14,22,24,30,34,38,40] There is, however, some difference of opinion as to the method which should be employed. Involvement of the lymph glands and failure to recognize the characteristic "skip areas" are the chief source of recurrences.[22,34] It, is therefore, essential that the surgeon examine every inch of the intestine before attempting any surgical procedure.

In a review of the literature,[40] out of 290 cases in which a resection was done, 67.0 per cent showed a complete recovery, 5.8 per cent had partial recovery, 3.8 per cent showed no improvement, and there were 6.2 per cent recurrences, with 7.2 per cent deaths. In eighty-eight cases in which a short circuiting procedure was done, 30.6 per cent completely recovered, 11.3 per cent showed a partial recovery and 5.7 per cent had no improvement; however, there were 28.4 per cent recurrences and 7.9 per cent deaths.

It is quite obvious from the foregoing data that the recurrence rate is considerably less when a resection is done regardless of whether it is a one-stage or two-stage procedure. The mortality is less with a resection than with a short-circuiting operation. Furthermore, the percentage of complete recovery is greater with a resection. These conclusions are not agreed to by all authorities.[22]

Summary

We have presented five cases of regional enteritis and a concise review of the literature.

The preoperative diagnoses in the five cases included acute appendicitis, carcinoma of the cecum, intestinal obstruction, ulcerative colitis, and tuberculous enteritis. They were apparently cured by resection of the involved area with no recurrence of symptoms over a period varying from one and a half months up to twelve years and four months.

References

1. Adams, G. Q.: Regional ileitis; A report of a case with its surgical treatment. Texas State J. Med., 39:570-578, (March) 1944.
2. Barbour, R. F., and Stokes, A. B.: Chronic cicatrizing enteritis; a phase of benign nonspecific granuloma of small intestine. Lancet, 1:299-303, (Feb. 8) 1936.
3. Bargen, J. A.: Regional enteritis. Wisconsin M. J., pp. 1-6, (Oct.) 1939.
4. Barnes, J. P.: Nonspecific granuloma of the colon. Texas State J. Med., 39:529-532, (Feb.) 1944.
5. Bockus, H. J., and Lee, W. E.: Regional (terminal) ileitis. Ann. Surg., 102:412-421, (Sept.) 1935.
6. Brown, P. W., and Donald, C. J., Jr.: Prognosis of regional enteritis. Am. J. Digest. Dis., 9:87-91, (March) 1942.
7. Brown, S.: Chronic nonspecific regional enteritis. Am. J. Roentgenol., 54:487-496, (Nov.) 1945.
8. Cash, I. I., et al: Regional ileitis involving the ileum, cecum, ascending colon and transverse colon. Ann. Int. Med., 25:351-362, (Aug.) 1946.
9. Clark, R. L., Jr., and Dixon, C. F.: Regional enteritis. Surgery, 5:277-304, (Feb.) 1939.
10. Colp, R.: Proximal extension and progression following operations for regional ileitis. S. Clin. North America, 27: 333-336, (April) 1947.
11. Cor, P., and Boeck, W. C.: Chronic ulcerative enteritis. Am. J. Digest Dis., 1:161-163, (May) 1934.
12. Crile, G., Jr.: Inflammatory lesions of the terminal ileum. S. Clin. North America, Cleveland number, pp. 1171-1184, (Oct.) 1939.
13. Crohn, B. B., and Yunich, A. M.: Ileojejunitis: Ann. Surg., 113:371-380, (March) 1941.
14. Crohn, B. B.; Ginsburg, L., and Oppenheimer, G. D.: Regional ileitis. J.A.M.A., 99:1323-1329, (Oct. 15) 1932.
15. Dickinson, E. H., and Zimmerman, L. M.: Acute bowel obstruction secondary to regional enteritis. U. S. Nav. M. Bull., 44:835-840, (April) 1945.
16. Dixon, C. F., and Clark, R. L.: Regional enteritis. Ann. Surg., 108:857-863, (Nov.) 1938.
17. Donald, C. J., Jr., and Brown, P. W.: Prognosis of regional enteritis. Proc. Staff Meet., Mayo Clin., 16:561-564, (Sept. 3) 1941.
18. Eckel, J. H., and Ogilvie, J. B.: Regional enteritis. Am. J. Surg., 53:345-348, (Aug.) 1941.
19. Erb, I. H., and Farmer, A. W.: Ileocolitis; acute ileocolitis, simulating appendicitis and characterized by edema of ileocecal region and mesenteric glands; its relation to "regional ileitis" or "chronic cicatrizing enteritis." Surg. Gynec. & Obst., 61:6-14, (July) 1935.
20. Erdmann, J. F., and Burt, C. V.: Nonspecific granuloma of gastrointestinal tract. Surg., Gynec. & Obst., 57:71-80, (July) 1933.
21. Fallis, L. S.: Regional enteritis. Case reports. Am. J. Surg., 62:225-230, (Nov.) 1943.
22. Garlock, J. H., and Crohn, B. B.: An appraisal of the results of the surgery in treatment of regional ileitis. J.A.M.A., 127:205-208, (Jan. 27) 1945.
23. Garlock, J. H.: The present status of the problem of regional ileitis. Am. J. Surg., 72:875-878, (Dec.) 1946.
24. Ginsburg, L., and Garlock, J. H.: Regional ileitis. Ann. Surg., 116:906-912, (Dec.) 1942.
25. Halligan, E. J., and Halligan, H. J.: Acute free perforation as first sign of regional enteritis. Am. J. Surg., 37: 493-497, (Sept.) 1937.
26. Horn, R. C., and Rhoads, J. E.: Regional enteritis involving Meckel's diverticulum. Ann. Surg., 119:274-278, (Feb.) 1944.
27. Jackman, R. J., and Smith, N. D.: Some manifestations of regional ileitis observed sigmoidoscopically. Surg. Gynec. & Obst., 76:444-445, (April) 1943.
28. Jellen, J.: Regional ileitis. Am. J. Roentgenol., 37:190-201, (Feb.) 1937.
29. Kantor, J. L.: Regional (terminal) ileitis. Its roentgen diagnosis. J.A.M.A., 103:2016-2026, (Dec. 29) 1934.
30. Kiefer, E. D., and Ross, J. R.: Criteria in the management of chronic ileitis. J.A.M.A., 129:104-108, (Sept. 8) 1945.
31. Kiefer, E. D.: The diagnosis of regional ileitis. S. Clin. North America, Lahey Clinic number, 862-872, (June) 1943.
32. Kraemer, M.: Chronic interstital enteritis. Rev. Gastroenterol., 4:239-246, (Sept.) 1937.
33. Leonardo, R. A.: Intestinal obstruction due to nonspecific ileocecal granuloma; combined "regional ileitis and colitis." Am. J. Surg., 35:607-608, (March) 1937.
34. Marshall, S. F.: Regional ileitis. Surgical management and results of operation. S. Clin. North America, Lahey Clinic number, 873-880, (June) 1943.
35. Mixter, C. G.: Regional ileitis. Ann. Surg., 102:674-694, (Oct.) 1935.
36. Moorehead, R. P.: Regional enteritis. North Carolina M. J., 8:216-219, (April) 1947.
37. Owens, F. M., Jr.: Regional enteritis. Arch. Surg., 48: 465-471, (June) 1944.
38. Puestow, C. B.: Diagnosis and management of regional enteritis. Postgraduate Med., 4:47-54, (July) 1948.
39. Pugh, H. L.: Regional enteritis. Ann. Surg., 122:845-861, (Nov.) 1945.
40. Ravdin, I. S., and Johnston, C. G.: Regional ileitis. A summary of the literature. Am. J. M. Sc., 198:269-292, (Aug.) 1939.
41. Ravdin, I. S., and Rhoads, J. E.: Regional ileitis and fibroplastic appendicitis. Ann. Surg., 106:394-406, (Sept.) 1937.
42. Reichert, F. L., and Mathes, M. E.: Experimental lymphedema of the intestinal tract and its relation to regional cicatrizing enteritis. Ann. Surg., 104:601-616, (Oct.) 1936.
43. Ross, K.: Regional ileitis. M. J. Australia. 1:321-323, (March 7) 1936.
44. Rossmiller, H. R., and Messenger, H. M.: Regional enteritis. diagnosis and treatment. M. Clin. North America, 32:419-427, (March) 1948.
45. Schepers, G. W.: The pathology of regional ileitis. Am. J. Digest. Dis., 12:97-116, (April) 1941.
46. Sneierson, H., and Ryan, J.: Regional ileitis. Am. J. Surg., 52:424-432, (June) 1941.
47. Smith, A. L.: Regional enteritis (terminal) ileitis. Brooklyn Hosp. J., 3:6-20, (Jan.) 1941.

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History of Medicine In Minnesota

NOTES ON MEDICINE IN FREEBORN COUNTY, 1857—1900

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Albert Lea, Minnesota

(Continued from September issue)

He then also writes of the county seat contest between Albert Lea and Itasca, in which "Dr. A. M. Burnham, who possessed rare energy and enterprise, was the genius of the place." This was a contest which was to be settled by a horse race between the Itasca Fly and Albert Lea's Old Tom. He relates:

"The race track was made on the smooth prairie, with two paths this time and so far apart that it was supposed Old Tom could not jump across into the Itasca Fly's track again. This time Old Tom had a rider. When the word was given Old Tom made for his antagonist's track and gained the lead, and when the pole was reached Old Tom was given the race by forty feet. Itasca folk had bet everything they had on the race. Those who lost their money and their cattle, horses and plows, chairs, pigs, chickens and knives, coats and hats, and guns and boats, began to get tired of Itasca and its sure thing, and voted for Albert Lea. The county seat question was settled by Old Tom, and Itasca collapsed as a townsite.

"In 1857 people got 4 pounds of brown sugar for a dollar. Syrup was $1.50 a gallon and salt ten cents a pound. Those who had traps sold coon skins for $3.50 to $4.00 apiece, muskrat skins for forty cents, and mink skins for $3.50. I remember our folks borrowed a setting hen long enough for her to hatch. There were swarms of mice and no cats. I remember an acquaintance allotted one to us from an expectant that gave promise of a small supply. When the word came, I (eleven years old) walked after it. I was not invited to dinner and so I walked the twenty-five miles on an empty stomach.

"It was considered proper to steal wood from the land speculators and from government lands. A neighbor of ours became discouraged on account of the depredations of the blackbirds and left his farm. One Sunday we went up there to look around and also to pick strawberries. The people from the prairie were thick as hops. Axes, crosscut saws, crowbars, and hammers were all doing their best. D-.R.- and Dr. Burnham got the best of the plunder, and those old veterans took plain saw logs."

The account goes on to tell of Indians coming off their reservations and striking camps in the settlements and proceeding on begging and stealing expeditions, and how an old trapper who knew how to handle them would roughly break them up.

"When the Rev. McR- preached, every one attended though everything was primitive in the extreme. On one occasion old Charles M., who was drunk, attended the meeting. Rev. McR- had told a story about a boy to illustrate some point. Old Charley wanted to know what had become of the boy, and called in an excited voice, 'I will give you a half a cheese if you will tell me what became of that boy.' The good man stopped his sermon and told old Charley the story. On another occasion, when the minister had assigned the hymns and the audience had sung them in a key a few octaves too high, he announced his text, and they sang that, too, in the same high screechy chord. This made the royal old man smile but it did not disturb him."—*Standard*, May 11, 1900.

In many instances the professional education of the early pioneer doctor was obtained by reading and practicing under a preceptor. On the preceptor's approval his pupils would begin their own private practice. After the license law was passed

in 1883, these prospective doctors usually attended medical schools and received certificates. The leaders in pioneer medicine, those who had taken both preliminary academy and college courses and held degrees from the leading medical schools, attended with surprising regularity the Minnesota State and the American Medical Association meetings. Medical ethics were held in high regard by these noble gentlemen, and they must have been masterful and dignified in council and at the bedside. They knew the art of medicine, their pharmacology, and their therapeutics. Their armamentarium, both as to proven drugs and surgical instruments and appliances, was of course, limited. The keen rivalry of the different schools—eclectic, homeopathic, and allopathic—had brought to light many effective tricks in compounding the indicated and delicately balanced medicaments. The king and the queen of all medicines were used in the early day in the form of laudanum and the infusion of leaves of digitalis. Laudanum with whisky was used liberally as an anesthetic in minor surgery and for extraction of teeth by turnkey. Infusion of digitalis was prescribed, with or without blue mass, when indicated and was continued until it resulted in a "puke or a purge." After stropping it on his boot, a doctor would use his jack knife, on occasions, to open an offending abscess and likewise for a hurried trachectomy.

Transportation in the early days was a problem for the pioneer doctor. A saddle-horse, with saddle equipped with saddlebags for drugs and supplies, was used if destinations led toward passable roads for horse and rider; otherwise, the lurching ox-cart was used. Later, with improved trails, the doctor would drive a span of horses hitched to a buckboard; and finally, he was spinning over country roads in an elegant covered buggy, drawn by a span of well-bred, spirited horses.

There were many deaths and injuries caused by the explosion of lamps from excessive residual gas in the kerosene. Injuries or deaths from runaways, freezing, drowning, suicide, and insanity were not uncommon. But the greatest tragedies were those resulting from preventable diseases, such as diphtheria and scarlet and typhoid fevers. One who has never entered the room of a typhoid fever patient, defenseless against flies, on that long lonely road for weeks, lying dehydrated in muttering delirium, with a distended rose-spotted abdomen and nervous twitching wrist with its soft dicrotic pulse, and a foul-coated tongue, has missed, fortunately, an unforgettable experience.

From the time of the panic of 1857 to the issuing of stable greenback currency at the beginning of the Civil War, there was no money. Immigration continued in increasing numbers, but the new settlers were, for the most part, penniless. Barter was the only means of trade. No doubt the pioneer paid in part his delinquent doctor bills by bringing him dabs of butter, eggs, hay, oats, and corn, and skins of mink, coon, and muskrat, or perhaps a bundle of home-carved ax-handles which the doctor could dispose of in his drug store. But usually his accounts remained unpaid through the years.

Largely for these reasons, nearly all the early pioneer doctors owned and operated drug stores as well as large farms. A few became enthusiastic breeders of cattle and swine and particularly trotting horses, both for racing and for use on the roads.

The leaders among the very early pioneers came from the East and were usually well educated. Academies and colleges in those days subjected their students early to the old classics and to the best in English literature. It is easily discerned from their speeches and their contributions to the press that they had dipped deeply into the ethereal spring. Some of them, including doctors, were orators who could make the king's English walk in majesty and grace. Some well-educated farmers,

too, could deliver Fourth of July orations that would stir the soul. The weekly newspapers carried full page chapters of installments of the best novels, as well as columns on current events. In the absence of libraries in those days, anyone with a dictionary could help himself to a lot of satisfactory amusement, as well as a very good knowledge of the English language, by spending a part of the long winter evenings in this pursuit.

Dr. A. C. Wedge, in his tribute to the Hon. William Windom, late Secretary of the Treasury, in a beautifully written encomium, not only portrays the outstanding character, rugged honesty, and integrity of his old friend, but he also reflects the same in himself (*Albert Lea Enterprise*, February 5, 1891).

The early men of medicine were versatile. They were civic-minded leaders. Inured to hardships themselves, they never forgot to extend a kindly comforting hand to the despairing, nostalgic mother and family of the struggling immigrant in times of stress. They were ministers, counselors, psychiatrists, lawyers, bankers, and doctors all in one. Their hearts were in medicine and dutiful service. Their hobbies were politics, farming, and stock breeding. Their amusements were travel, reading, memberships in scientific and literary societies, hunting, fishing, and fast-trotting horses. The gospels of Pasteur, Lord Lister, Koch, Klebs, Loeffler, Virchow, Bilroth, and famous men of more recent years were not theirs to turn to and contemplate; and they stood as helpless before the ravages of diphtheria, scarlet fever, and typhoid fever as they did before the storms, blizzards, and grasshoppers. They drew a tough assignment in a tough place. They redeemed the pledge they had made.

"The man who is able to put all he owns on earth into one canvas-covered wagon—wife, children, household goods, all—and move with slow pace into what has been called the Wilderness of the West, is doing a work for himself, his family, for civilization, his country, and his God that can never be fully known or its influence told, until the final disclosure."—Senator C. S. Pomroy, Kansas, May 5, 1862.

Public Health and Sanitation

After the legislative act of 1872, setting up a State Board of Health and Vital Statistics, we find in the board's report that the number of births in that year was 322. Of these, 164 were Norwegians; seventy-nine, Americans; fourteen, Germans; thirty, Danes; twenty-six, Irish; three, Swedes; two, English; and four, Canadians.

In 1874, there was an epidemic of smallpox, scarlet fever, and typhoid fever. In 1873 a case of leprosy was treated by Dr. J. Froshaig, and records reveal that with the assistance of Dr. Wedge he amputated a part of a patient's foot.

The following is a notice from the department of the State Board of Health dated April, 1874:

"To the Albert Lea Board of Health: Please keep me informed of diseases prevailing and of sanitary work in your district. May I suggest careful sanitary survey of your town including water supply, wells, springs, and to see that they are not contaminated. The Board suggests that you collect regular statistics of births and deaths in accordance with registration laws."

In January, 1891, city physician H. H. Wilcox reported thirty-two deaths, itemized as follows:

"Consumption, nine; pneumonia, four; membranous croup, three; cancer of stomach, two; meningitis, one; appoplexy, one; typhoid fever, two; puerperal sepsis, one; paralysis of the brain, one; unknown, five; total, thirty-two. Of these, seven were over fifty years of age."

Report on "Vital Statistics" for 1895:

"Deaths, native, 105; Norway, thirty-three; Denmark, seventeen; Germany, five; Ireland,

eight; Sweden, two; England, two. Cause of death: consumption, ten; heart disease and pneumonia, eighteen; inflammation of the bowels, seven; diphtheria, seven; cancer, six; appendicitis, four; typhoid, three; meningitis, three."—*Enterprise,* January, 1895.

Dr. Ludvig Hektoen in collaboration with a historian in *Studies and Records* (vol. 1, pp. 19-21), has this to say about infectious and contagious diseases among Norwegian immigrants: "Their spread was advanced by the unsanitary conditions and practices of many of the early pioneer settlements, where nothing was done to disinfect or properly dispose of the highly infectious discharges. Not even outhouse toilets were in use in the early days on the frontier; windows were not screened; few pioneers dug wells, and those who did, oridinarily made very shallow ones; water was taken from streams and springs or lakes, stored in barrels and often contaminated." Dr. Hektoen and his collaborator relate that among the Norwegian immigrants "not only malaria and cholera, but many other kinds of diseases, were prevalent in pioneer settlements, including pneumonia, typhoid fever, and tuberculosis." "One of their most interesting gneralizations is that "Fewer (Norwegian) persons seem to have died of tuberculosis in those early days than later," and they conclude that this high mortality rate among the Norwegian people in America, even up to our own day, is probably the heavy penalty for the poverty, squalor, and hardships of pioneer days." These observations are entered here because immigrations to Freeborn Country from very early days have been preponderantly Scandinavian.

In 1874 there was an epidemic of smallpox, scarlet fever, and typhoid fever. In 1881, a smallpox epidemic occurred and isolation was ordered.

"Scarlet fever, a severe epidemic. Three children in one family succumb. It should be noted that scarlet fever is equally contagious as smallpox. It is readily communicated through clothing and for a considerable distance in the air. Greatest care should be exercised to keep patients isolated and prevent all visitors except physician—Board of Health."—*Standard,* August, 1881.

The 1887 session of the legislature provided for reports of vital statistics and also enacted the first meat inspection laws:

"Each local board of health to set up an inspection service to pass on cattle, swine, and sheep, twenty-four hours before slaughter and to certify same for human consumption."

Reports in the newspapers show that on one day in 1870 seven hundred teams of oxen and horses were counted on the streets of Albert Lea. The custom was to unyoke and unhitch on the streets, and tie the animals to the wagons, supplied with hay and feed. The decomposition and filth from all the litter on the streets was unbearable, and the muck in the streets rendered them almost impassable. The Board of Health ordered the segregation of teams away from the main streets, passed ordinances relating to carelessly constructed privies, made provisions for safer dumping grounds, and declared the drainage from these to be a nuisance. Perhaps this mounting offense to sight, smell, and general transportation was what induced the rugged editor at that time to spew this one, which also involved a serious health problem:

"We do not have many rattlesnakes in this section, but we do have any amount of whisky. For fear they may take a trip over here, note that it would poison a rattlesnake if one bit some men we know around here."—*Enterprise,* April, 1874. "The smell from the dumping grounds this side of the old mill is anything but pleasant to the olfactory nerves. Those who have charge of the matter are exceedingly derelict of duty."—*Standard,* July, 1891.

Not until May, 1894, was a petition made by the Board of Health for public dumping grounds in Albert Lea. In 1894 Dr. J. M. Todd, president of the board, pronounced the slaughterhouse and packing facilities to be a nuisance the way they were operated. There being no sewers provided, it was impossible to run it in a cleanly manner, and he advised that it be moved outside the city limits.

In May, 1893, at the request of Dr. J. M. Todd, president of the Board of Health, Dr. C. N. Hewitt, president of the Minnesota State Board, visited Albert Lea. He investigated the sanitary conditions of the city and inspected nuisances about which there were complaints. A public meeting was held to listen to an address by him. "With pungent facts, forceful argument, and key wit, he proceeded to show how cholera, smallpox, and similar diseases were brought to America, and how easily they spread. He made clear the thoroughness now being adopted by national and state officials in regard to vaccination. He also made a plea to abolish privy vaults and cesspools. The city should no longer permit them in our midst. He advised against sewage being emptied into either of the two lakes."—*Standard,* May 17, 1893. There were no regular county physicians in Freeborn County's early days. The poor were attended by local physicians, who presented annual bills to the County Commissioners. During the first half of the 1870's, the total annual payments averaged from 150 to 250 dollars. The epidemics of diphtheria, scarlet fever, and typhoid fever through the 1870's and 1880's were at times frightening in their ravages. A pioneer physician told the writer forty-five years ago that it was his honest belief that antitoxin in cases of diphtheria in those days would have been unavailing because of the severity of the disease, with deaths often coming in twenty-four to thirty-six hours.

Hospitals

Not until 1894 was any attempt made to provide hospital facilities. In that year Dr. J. M. Todd publically advertised for hospital purposes, "a building thoroughly equipped with trained nurses, electric and medical baths, and every convenience for treating chronic and surgical diseases." The following year, 1895, Dr. Frank A. Blackmer erected a building on his residential property, where he equipped and operated a ten-bed hospital.

"A public meeting was called in the courthouse to see what could be done about building a public hospital. Dr. A. C. Wedge was chosen president and Dr. H. H. Wilcox, secretary. Dr. J. M. Todd stated that all physicians in the city wanted such a public hospital, and Dr. Wilcox thought that a public hospital was an absolute necessity. All favored purchasing Dr. Todd's hospital with its ten beds, and a committee was selected either to purchase Dr. Todd's hospital or make arrangements for procuring another."—*Enterprise,* November 19, 1896.

Nothing came of this venture, and in August, 1897, Dr. Wilcox equipped a part of his large residence and operated his own private hospital. In the meantime, Dr. J. M. Todd in April, 1897, sold his fine hospital and went to New York City to enter the business world. But even as Dr. Todd sold his hospital, another was being built under the direction of Dr. Henrik Nissen. He erected a large three-story brick building on south Broadway in Albert Lea, well constructed with accommodations for a large pharmacy on the ground floor and offices, operating room, and about twelve beds on the second and third floors. Thus in 1898, Albert Lea was provided with three private hospitals. In March, 1898, Dr. H. H. Wilcox wrote from Chicago, where he often went to observe and learn, as follows:

"Without doubt Albert Lea ought to have one good general hospital where all physicians might have designated days for operations. Such an institution with physicians organized

into a local society would be of much value to the city, southern Minnesota, and northern Iowa. No one wanted such an institution more than I. Now that I have a good place of my own, I must work to make it pay; and hence, my attendance here now."—*Enterprise*, March, 1898.

These small hospitals served the most pressing needs, but they did not prove financially successful and were abandoned by 1905. In December, 1905, a meeting of citizens was called to consider the hospital project. The result was the organization of the City and County Hospital Association, with a board of directors given power to act. Funds were raised and the Wilcox hospital was taken over on a rental basis for a period of five years. In the meantime the campaign was on, public interest was surprisingly great, and early in 1912 the Albert Lea general hospital project was solved for the immediate present by moving all patients into the new Naeve Hospital of the City and County. Its name was derived by reason of a generous gift of home and grounds from a wealthy widow, Mrs. Naeve. At this writing a new addition is being completed which will supply one floor for surgery and approximately sixty beds, giving a total of 140 beds.

Education and Health

Early public education provided no instruction relating to health. In 1857 the population of Albert Lea was 285 and the total of the county was 2,486. The Albert Lea district provided a levy of $400 for a school building. Sixteen rural districts were organized in 1857. Some townships had several; others, none; but in almost every settlement schools were sustained in a private way. In October, 1857, the records show the total school funds available to be $398.96, or exactly $1.70 for each pupil. Compared with the school programs of today it reveals a sorry situation.

Knowledge as to health had to come from the doctors, either through private consultation or by attendance at forums, societies, and lodges, where they were active leaders. Dr. Elizabeth Stacey afforded active and effective leadership in organizing temperance societies that met regularly and in earnest endeavor and were of much benefit. But to get to their doctors and to these meetings beyond a distance of five miles, transportation by ox-cart required a day and a night's travel for only a good yoke of oxen could travel up to twelve miles in a full day. Hence, for the most part the early rural pioneer was on his own in matters of health. Self-medication was practiced to a high degree and often with great rivalry. To reveal the extent to which this was carried on, the autobiography of a county doctor in 1873 contains the following excerpts that reveal the assumed professional wisdom of some folks in matters of health and disease:

"Deacon Rogers he came to me.
'Wife is going to die'! said he.
'Twenty old women with remedies now
Bother my wife all day through.
Sweet as honey, bitter as gall,
Poor old woman she takes them all.'

"Mrs. Rogers lay in her bed,
Bandaged and blistered from foot to head.
Bottles and saucer, spoon and cup,
On the table stood bravely up.

"Physics of high and low degree;
Calomel, catnip, bone-set tea;
Everything a body could bear,
Excepting light and water and air.

"I opened the blinds, the day was bright;
And God gave Mrs. Rogers light;
I opened the windows, the day was fair,
And God gave Mrs. Rogers air.

"Bottles and blisters, powders and pills;
Catnip, bone-set, syrup of Squill's;
Drugs and medicines high and low;
I threw them as far as I could throw.

"'What are you doing'? my patient cried;
'Frightening death'! I cooly replied;
'Are you crazy'? a visitor said;
I flung the bottles at her head.

"Deacon Rogers he came to me.
'Wife is coming around', said he;
'I really think she will worry through,
She scolds me just as she used to do'.

"All the people have pooed and slurred;
All the neighbors have had their word!
'Your wife,' said I, 'has God's good care
In his remedies, light, water, and air;
All the doctors beyond a doubt
Couldn't have cured Mrs. Rogers without.'

"The Deacon smiled and bowed his head,
'Then your bill is nothing,' he said.
'God's be the glory, as you say,
God bless you, doctor, good day! good day!'"

Medical Societies

Freeborn County was late in promoting the organization of its medical men. Dr. Wedge had, however, called the fraternity together, perhaps under the authority of the forum he founded in 1857 and called the "Albert Lea Senate." The call stated the "purpose of counseling together in good fellowship." October, 1898, the Albert Lea District Medical Association was organized, whose membership comprised doctors of Freeborn County and of Worth and Winnebago Counties in Iowa. Dr. A. C. Wedge was chosen president; Dr. W. H. Jones of Forest City, Iowa, vice president; and Dr. H. H. Wilcox, secretary. Nineteen members were present at the meeting. The membership was later increased by the addition of doctors from Lake Mills and Northwood, Iowa. The Freeborn County Medical Society was organized January 2, 1903, according to the provisions of national, state, and county relationship. Dr. A. C. Wedge was chosen as its first president and served until May, 1907. He was succeeded by Dr. G. W. Barck. He in turn was succeeded by Dr. J. P. Von Berg in 1909, who continued to serve until 1925. Dr. H. H. Wilcox was the first secretary and was succeeded in 1904 by Dr. G. A. Stevenson. As Dr. Stevenson exercised his usual veto and refused to serve, Dr. O. E. Burton was elected. Dr. W. L. Palmer was the first vice president. Total membership at the organization meeting was fifteen.

(To be continued in the November issue)

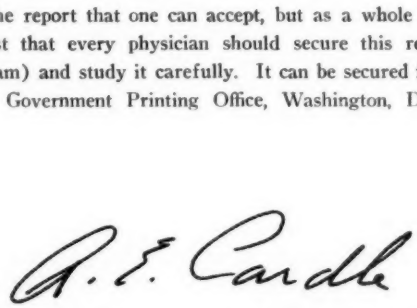
President's Letter

THE NATION'S HEALTH

The long awaited report from the National Health Assembly, that met in Washington on May 1 to 4, 1948, has finally been published, as released by Federal Security Administrator, Oscar R. Ewing. It is a broad plan and has the endorsement of President Truman, and includes most of the President's earlier health proposals. As was expected, the report as submitted goes beyond the recommendations that had been developed during this four-day conference. Mr. Ewing has also added his own interpretation and recommendations. The document was politically prepared and has been timed so it can be used during the forthcoming campaign, and places compulsory health in the political arena. The report is well-prepared and is packed with governmental health statistics, which the average citizen accepts at face value. Most of the figures are so general that they are misleading and actually could not be supported by scientific facts. After having read the report, one is left with the impression that the Government is going to give the people of our country something for nothing. But, of course, this is never true, as every dollar which is spent by the Government comes from the American taxpayers.

In addition to compulsory health, Mr. Ewing proposes to develop an expanded program of Medical Education, Research, Hospital Construction, Hospital Maintenance, and Community Health Protection. The cost of this proposed program would be boosted to 4.1 billion dollars by 1960, or more than double the present yearly outlay of two billion. Of course, this does not include the cost of compulsory health insurance, which would add many more billions to the taxpayers' bills.

There are several recommendations in the report that one can accept, but as a whole it is unsound and impractical. I would suggest that every physician should secure this report (The Nation's Health—A-Ten-Year Program) and study it carefully. It can be secured from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. The cost is one dollar.



President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor;* GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

MORE DOCTORS NEEDED IN THE ARMED SERVICES

WHEN the Selective Service Act of 1948 was being considered by Congress, it was proposed that the medical profession be drafted as a matter of necessity. Protestations on the part of the profession against the drafting of members of the profession, which would have been the first time during either war or peace that such a step was taken, resulted in the omission of this provision. The profession virtually assured the Army that sufficient medical men to care for draftees would enlist voluntarily.

The Selective Service Act of 1948 provides that no individual shall be inducted until adequate provision shall have been made for his proper care, including medical care and hospital accommodations.

The Army Medical Department needs some 6,900 doctors. At present, it has about 3,000, including interns. If sufficient enlistment of doctors is not forthcoming in the immediate future, the draft program will have to be slowed up, and if by the time the next Congress convenes there is a dearth of enlisted doctors, remedial legislation will doubtless have to be considered.

The drafting of doctors should not be necessary in the near or distant future. Thousands of young doctors have been allowed to pursue their medical education at government expense, and while perhaps not legally bound to enlist, they are so bound morally. Further, the inducements from the standpoint of rank and pay have been increased, and interns and residents who enlist are permitted to continue training in either civilian or Army hospitals. Doctors who enlist are commissioned as lieutenants and receive $380.00 a month as pay. Similar inducements are offered by the Navy.

It is reassuring to learn that while the Selective Service Act of 1948 designates men between nineteen and twenty as subject to draft, it seems assured that medical students and interns will be deferred until they complete their training. A certain number of premedical students will also doubtless be deferred to assure the graduation of enough medical students in future years.

Not young doctors alone are desired for enlistment. It is understandable that those who were undergraduates during the war period have not had the experience to handle all the army medical needs. Older and experienced men are indispensable. A continuous new supply is also needed to replace those, both young and old, who are daily retiring.

It can be expected that the profession will respond to the present urgent need so that our record for patriotism, in peace as well as in war, will not be broken.

ARE YOUNG SPECIALISTS DENIED A CHANCE?

WE don't often read the *Woman's Home Companion.* However, our attention was called recently by a full-page newspaper advertisement to an article appearing in the October issue by J. D. Radcliff, entitled "Give the Young Doctor a Break." We yielded to a feeling of curiosity and purchased a copy and read the article. This, of course, was in keeping with the purpose of the advertisement.

An introductory paragraph quotes Dr. Allan D. Whipple, a former president of the American Board of Surgery, as follows: "There is no doubt that these young qualified doctors are prevented from demonstrating their ability in a good number of communities by the failure of local physicians to give these younger men opportunity to practice in the hospital or hospitals in the community. Dean Willard C. Rappleye of Columbia College of Physicians and Surgeons is also quoted as saying that this situation is "the greatest waste in medical manpower and skill in our present system of medical service."

The article goes on to state that a young specialist, denied hospital facilities, is unable to make use of his skill, improve himself through the use of the hospital library, build up his practice or

even support his family. This is perfectly true. It relates how in certain localities certain industrial surgeons employed in war industries were prevented from having hospital appointments for a period of five years on entering private practice. It relates the case of a young surgeon in a Pennsylvania manufacturing town who in his first year of practice performed just eight operations and all were on the wives of physicians. The local profession recognized his skill, but their failure to refer patients to him resulted in his leaving town. This is too fantastic for belief. The supposedly pathetic story of Jim who had spent years in acquiring a top-notch surgical training and his difficulties in finding a location so that he was finally forced to accept a $3,600 job as surgical instructor at his alma mater somehow fails to elicit tears. Somehow one feels the temporary job may lead to bigger and better things.

The entire article is tinged with sensationalism and gives the lay reader the impression that the older members of the medical profession are, as a rule, less skilled than the present-day Specialty Board licentiate and through jealousy prevent the young specialist from competing by preventing him from obtaining hospital appointments to the detriment of the public.

How much foundation there is for the accusation, as far as the country at large is concerned, is difficult to evaluate. We do know that it is common practice for established specialists to take young men under their wing and help them get started. While there are doubtless selfish and jealous doctors, it would seem rather exceptional for them to be able to prevent a young potential competitor from obtaining the use of a hospital simply in order to forestall competition. That this should ever occur is, of course, reprehensible.

While the article smacks of sensationalism and is not a picture of the general setup, it affords food for thought. Do we as individual doctors and as organized medical societies do what we can and should to help the specialist or, for that matter, the general practitioner who hangs out his shingle?

County societies in the past have been so fearful of admitting to membership undesirable members of the profession that they have required a period in some instances of a year of practice or several months of investigation before admitting strangers to society membership. Such perquisites as malpractice insurance, hospital staff membership, appointments as examiners for life insurance companies and the like being dependent on county society membership, such requirements have in the past made the beginning of practice the more difficult. Some societies have corrected such unjust provisions in their constitutions.

To become established in a medical practice has seldom been an easy matter. The great majority of doctors have found the building up of a clientele a slow procedure. It has been said with some truth that the young doctor spends his early years trying to get patients and his later years in trying to sidetrack them. An able and well-trained doctor, be he specialist or general practitioner, cannot as a rule expect the local profession to swamp him with patients from the start nor the local public to be waiting to welcome him with open arms. The specialist who has spent additional years in preparation is conceivably more likely to feel restive at the slowness of what may be a normal growth of practice. The training of too many specialists which, as we have pointed out before, has been going on in recent years, only tends to aggravate the seemingly slow process of building up a practice, and with the increased production of specialists in the near future, the tempo is likely to be still further slowed. We contend that the overproduction of specialists is going to prove "the greatest waste in medical manpower." The production of specialists should be restricted.

In view of the scarcity of hospital accommodations, it is conceivable that a specialist or, even more perhaps, a general practitioner on starting practice and having difficulty in obtaining hospital beds for patients might feel he is being discriminated against by the hospitals. All doctors are having the same experience and are liable to entertain an unjustifiable resentment at a fancied injustice.

Some medical societies have been conscious that they have not been of as much assistance as possible to the young doctors opening an office for the first time in their locality, and the need for remedying the oversight is shown in the case of the Ramsey County Medical Society in Saint Paul. Junior memberships were recently established for these new men which entitle them to all perquisites of membership after a brief period

(Continued on Page 1140)

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

COUNTY SOCIETIES DEVELOPING "NIGHT CALL" ARRANGEMENTS

Securing of emergency medical aid at night has long been a source of difficulty and misunderstanding between the public and the medical profession. At the urgent request of the American Medical Association, medical societies throughout the country have been studying ways and means of working out the problems involved.

Incidents of failure to locate or secure the services of a doctor undermine the prestige of the profession, it has been shown. Therefore it was suggested that local physicians' telephone exchanges be established or that there be maintained at local society headquarters a system of rotating night duty together with a list of physicians willing to assume that responsibility.

The subject of "night calls" was discussed at the Council on Medical Service meeting last February in Chicago, when the various methods of handling emergencies were discussed.

Although the law does not compel a physician to respond to an initial call, and the code of ethics allows a physician the freedom of choice in whom he will serve, the public nevertheless *"wants a doctor when it wants him."* Because of the demand for service remedial programs are under study, and a good example is the program being formulated by the Northampton County Medical Society, in Pennsylvania. A group of doctors on the staff of Easton, Pa., Hospital* have formulated a statement outlining their views, which seems a sensible approach.

Refusing Calls Dangerous

Refusal on the part of too many physicians to accept emergency calls, particularly night calls, is a dangerous practice and is becoming a wedge in the attack upon private practice of medicine, the Easton doctors warn. Proof that the problem exists, they say, is evidenced in the nationwide propaganda appearing in newspapers and magazines. After due consideration, the doctors concluded that the problem of night calls is, first of all, primarily a problem of practicing physicians in general practice and internal medicine or related specialties, that physicians should personally see that their patients are covered at all times. These doctors suggest the attending physicians inform patients as to whether they will or will not make night calls and thus give their patients opportunity to choose another physician, should they so desire.

When a physician does not or cannot make a call at night, it is his duty to see that another physician sees his patient, either a colleague or a younger man, according to the Easton doctors. They add that arrangements should be made when the attending physician will be away from home for twenty-four hours or longer. Furthermore, they suggest that when a colleague must be summoned, that the physician himself make the call rather than his patient, who, as a stranger, stands less of a chance of getting medical aid.

Problem Is Local

It has been suggested that a registry be maintained in the centers of the community listing the names of all physicians who have signified willingness to make night calls and that these men should be called in rotation. If this is not feasible, the local society must take the initiative and designate a group of physicians to be responsible for night calls during a specified period.

The prerogative and the duty of finding answers to the community medical needs are, of course, that of the county medical society, since plans will undoubtedly be modified by local conditions and needs. It is agreed that the clamoring of socialistically minded and anti-medical groups must be answered and that the county

*Morris Kramer, M.D., Frederick Ward, Jr., M.D., and Frederick Clarke, M.D., prepared a report of the Easton Hospital plan for the *Public Relations Reporter* of the Pennsylvania Medical Society, July 20, 1948.

medical society is the logical place to begin. It is suggested also that the public be made aware that emergency and night service is available to them, whether it is through an individual working arrangement between patient and doctor, by a registry system or by a roster maintained by the county medical society which has designated a group of members to make night calls.

A notable example of efficient management of the night call problem is the plan being followed in Cleveland. Cleveland physicians have taken the position that "response to emergency calls for help from its citizens is the responsibility of the entire community in its official and unofficial capacities."* Just as police and fire departments handle emergencies and city hospitals maintain ambulance service, the doctors in Cleveland have over a period of ten years maintained a system for caring for emergent needs of their patients and have recorded some of their findings.

Many emergency calls, they have found, aren't really serious; but, on the other hand, they maintain, in most cases, only a physician can determine ultimately whether an emergency exists, hence the need to respond promptly to requests for assistance.

With a well-organized round-the-clock switchboard service, such as would be difficult to maintain without proper facilities, Cleveland physicians have been operating a service which has been a source of help to the public in various ways—by answering individual calls for medical care and by providing also assistance to police and firemen who frequently call the exchange for accidents and sudden illnesses when it is not possible to transport victims via ambulance to a hospital.

Average 8.7 Minutes Per Call

The Academy has found that in a group of 300 emergency calls studied, the average length of time elapsing between the call for service and contact with a doctor able and willing to provide service is only 8.7 minutes. Of the 300 calls, there were fourteen that took an unusually long time due to extenuating circumstances. When these were not counted, the average time to locate physicians drops to 6.8 minutes. At a time when anxious relatives are inclined to translate minutes into hours, this average makes for a minimum of inconvenience and friction.

Cleveland's experience is that it is most difficult to reach physicians between 6 and 7 p.m., when most of them are on the way home. During that hour it has taken the switchboard up to twenty minutes to locate a doctor.

The Cleveland study of emergency cases reveals cases where doctors are needlessly called and has put the service on its guard against exposing doctors to such inconvenience. For example, cases occur where someone has summoned a doctor through the telephone exchange, and, upon arriving, the doctor discovers that the police and several helpful neighbors have also summoned other doctors. There are also cases of drug addicts or chronic drunkards who summon physicians when they really aren't needed. The service seeks to eliminate for the physicians such wasted trips.

Thus it is felt by the Cleveland Academy that although it is not legally bound to maintain its call service and that maintaining it entails a certain amount of sacrifice on the part of the members, the grateful response on the part of the public and the satisfaction that a real and efficient public service is being carried out is rewarding enough to argue for the continuance of the system.

*Bulletin of the Academy of Medicine of Cleveland, April, 1948, Page 7.

MEDICINE FACES CRISIS, DOCTOR HAWLEY DECLARES

Medicine is facing a crisis—either it must act or perish—according to Dr. Paul R. Hawley, former chief of the medical division of the Veterans Administration, who now heads the Blue Shield-Blue Cross national commission. Dr. Hawley delivered a scorching warning to the medical profession at the Conference of Presidents and Officers of State Medical Societies at the AMA Chicago meeting last June when he painted a very discouraging picture of medicine surrounded by forces seeking to overthrow it. The only solution, Dr. Hawley maintains, is the extension of prepayment medical and hospital service—at once.

Dr. Hawley pointed out that medical care is no longer the exclusive prerogative of doctors, that consumers have a great stake in it, as borne out by the discussions at the recent National Health Assembly. Such groups as labor, co-op-

eratives, veterans, colored people and the Physicians' Forum are supporting the contention that compulsory health insurance is the only way to meet the standards of health care set up by the National Health Assembly, that voluntary plans "don't go far enough."

The powerful labor unions, medicine is well aware, have for some time been developing health and welfare programs for workers. Medicine hasn't been consulted in the setting up of a single one! The co-ops are busy with proposals to extend their influence and gain certain controls. Dr. Hawley names men in top positions in health plans throughout the United States and Canada who frankly favor government taking over medicine. Speaking of the co-operatives, Dr. Hawley declares:

"I cannot stress too strongly the fact that this movement has already reached the point where the medical profession has the choice only of making a reasonable effort to meet the requirements of these large groups of consumers of medical care, or of watching the private practice of medicine in this country being rapidly strangled either by co-operative or government medicine."

Need a Comprehensive Plan

What does Dr. Hawley suggest? Well, first of all he wants a comprehensive voluntary insurance plan to meet the public demand. The plan, he says, regardless of cost, will have to offer more than one type of contract, according to what the people want to buy—a contract within the reach of low-income groups that will bear all or part of its costs, and in addition a contract for those large union groups who demand more comprehensive service and are both willing and able to pay for it.

Dr. Hawley also suggested that there be a national service agency, controlled by all participating Blue Shield Plans. Dr. Hawley states positively that he believes no individual, local efforts are going to turn the trick without some national co-ordination. He gives the medical profession exactly three years until heavy financial commitments of the government such as the Marshall Plan and the re-armament program will have eased a little and politicians will be able to work in a health tax. Arguments using logic won't help, Dr. Hawley says. The issue will be decided, not by *wisdom*, but by *emotion*—try as medicine may to educate the public on the issues at stake. Only an accomplished fact—a broad, comprehensive program providing the public with the coverage it wants—will save medicine, Dr. Hawley concludes.

ENROLLMENT TOPS 5,000 IN GENERAL PRACTICE GROUP

With an enrollment now of well over 5,000 members, the American Academy of General Practice (AAGP) is going into its second year as a national organization. Big plans are now under way for the first Annual Scientific Assembly, to be held in Cincinnati at the Netherlands Plaza Hotel, March 7, 8 and 9, 1949.

At that meeting, officers of the Academy who were elected at the first Congress of Delegates, held just previous to the AMA meeting in June, will assume their posts. They are: Dr. E. C. Texter, Detroit, President; Dr. Stanley Truman, Oakland, Calif., President-Elect; and Dr. U. R. Bryner, Salt Lake City, Treasurer.

The AAGP is now publishing its own regular Journal, *General Practice News*, a four-page bulletin which appears each month. Doing an excellent job in presenting news of interest to men in general medicine is Mr. Mac F. Cahal, who is also Executive Secretary and General Counsel, with offices in Kansas City, Missouri.

Here in Minnesota, where a national movement to improve standards and advance the position of general practitioners began, a Chapter of AAGP has been organized. Last June following a vote to amalgamate the original organization—American College of Physicians and Surgeons—with the newer group, a charter was granted by the AAGP and the Minnesota Chapter, American Academy of General Practice, was launched. It is planned to have regional groups of the organization throughout the state, eight of which are already in existence.

The local chapter is now extending an invitation for general practitioners to join the Academy. Any general practitioner may write for information to Dr. G. P. Wenzel, Secretary of the Minnesota Chapter, 891 Rice Street, St. Paul. It is necessary to become a member of the Minnesota Chapter before one can join the national organization.

Officers of the state group, elected last October, in addition to Dr. Wenzel, are: Dr. C. S. Don-

aldson, Foley, President, and Drs. James Cosgriff, Olivia, C. J. T. Lund, Fergus Falls, and Gordon Samuelson, Mankato, first, second and third Vice-Presidents, respectively.

The purpose of the state organization closely parallels that of the national group and consists mainly in constantly striving to improve the standards of medicine as practiced by the general practitioner. This is to be done by promoting and maintaining high standards of general medicine and surgery, by assisting in providing general practitioners with postgraduate courses and encouraging them to participate in the courses.

PRACTICAL NURSE LICENSURE IN OPERATION ONE YEAR

In operation one year on August 1, 1948, the Minnesota program to examine and license practical nurses promises to aid greatly in filling the need for qualified persons to provide bedside nursing care.

During the year the original Board of Nursing Examiners consisting of seven members has carried out the terms of the Practical Nurse Licensure law, with the assistance of three additional members, one a physician, one a hospital administrator and one a licensed practical nurse.

The Board reports that out of a total number of 461 candidates taking the first examination given on February 21, 424 were passed and were granted L.P.N. degrees.

In the board's major undertaking the past year, it reports that in developing and planning for maintenance of standards for schools of practical nursing, it aimed to prepare a guide to those institutions and organizations planning to conduct accredited schools of practical nursing and for the use of the board as the accrediting body in determining the eligibility of schools for accreditation, the guide to include the purposes and objectives of a school of practical nursing.

Miss Leila Halverson, who has for many years served the Nursing board as its secretary-treasurer and who has most efficiently administered the work of the board, has resigned, effective September, 1948. Miss Helen G. Schwarz becomes the board's executive secretary and will be assisted by Miss Leonora Collatz. Both of these women are extremely well qualified and will continue to carry on the important work of maintaining the standards of nursing in this state.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul, Minnesota

Julian F. DuBois, Secretary

Minneapolis Painter and Decorator Pleads Guilty to Abortion

Re State of Minnesota vs. Gerald E. Humphries

On September 21, 1948, Gerald E. Humphries, forty-one years of age, 2015 22nd Avenue South, Minneapolis, was sentenced by the Hon. E. A. Montgomery, Judge of the District Court of Hennepin County, to a term of not to exceed two years at hard labor in the State Prison at Stillwater, following Humphries' plea of guilty on September 4, 1948, to an information charging him with the crime of abortion. The Court stayed the sentence and placed the defendant on probation for two years.

Humphries, who is married and the father of four children, was arrested on September 2, 1948, following a report to the Minnesota State Board of Medical Examiners from a Minneapolis hospital, that a twenty-three-year-old Minneapolis woman had been received at the hospital suffering from the after effects of a criminal abortion. The patient stated that she had been aborted on August 19, 1948, by a man she knew only as "Doc." Subsequent investigation by a representative of the Minnesota State Board of Medical Examiners and Minneapolis police officers disclosed that the abortion had been performed by the defendant, Gerald E. Humphries. Humphries was promptly arrested and admitted that he had performed the operation and had received $125 for his services. The defendant also admitted that he had performed a total of seven abortions during the past four years.

The defendant admitted that he had no license to practice any form of healing in the State of Minnesota. He gave his occupation as that of a painter and decorator. He claimed, however, he had been a premedical student for a period of two years.

Minneapolis Pair Plead Guilty Following Arrest for Abortion

Re State of Minnesota vs. Lucille P. Olson and Charles R. Conry.

On September 14, 1948, Charles R. Conry, thirty-two years of age, 3608 Orchard Avenue, Robbinsdale, Minnesota, was sentenced by the Hon. Paul S. Carroll, Judge of the District Court, of Hennepin County, to a term not to exceed four years in the State Prison at Stillwater, following Conry's plea of guilty on July 17, 1948, to an information charging him with the crime of abortion. The Court placed Conry on probation for five years on condition that he remain in the State of Minnesota, be gainfully employed and support his family.

A complaint was issued for Conry and the defendant, Lucille P. Olson, charging each with the crime of abortion. The alleged abortion was performed on a twenty-six-year-old divorced Minneapolis woman who claimed that Conry was responsible for her pregnancy. The defendants were arraigned in the Municipal Court in Minneapolis on June 9, where each waived a preliminary hearing and were held to the District Court for trial. Upon being arraigned in the District Court on the same date, both defendants entered pleas of not guilty,

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MINNESOTA STATE MEDICAL ASSOCIATION
House of Delegates
Summary of Proceedings*
Minneapolis Session—June 6-7, 1948

First Meeting, Sunday, June 6, 1948
Gold Room, Hotel Radisson
Minneapolis, Minnesota

The Ninety-fifth Annual Session of the House of Delegates of the Minnesota State Medical Association convened in the Gold Room, Hotel Radisson, Minneapolis, Minnesota, at 2 p.m., Dr. C. G. Sheppard, Hutchinson, Speaker, presiding.

Dr. Sheppard called the meeting to order and asked for the report of the Credentials Committee. Dr. C. S. Donaldson, Foley, reported that a quorum was present. After approval of the minutes of the 1947 session of the House, Dr. Coventry introduced two distinguished guests to the assembly, Dr. L. W. Larson, Bismarck, Secretary of the North Dakota State Medical Association, and Mr. C. H. Crownhart, Madison, Secretary of the State Medical Society of Wisconsin. Both guests addressed the House briefly and brought greetings from their respective organizations. Dr. Sheppard then called on Dr. A. W. Adson of Rochester, who presented a special citation to Dr. Ludwig L. Sogge of Windom.

DR. ADSON: Too often in the course of our normal activities in state societies we give responsibilities to men, expect them to continue and achieve everything that we hold desirable, feeling free to criticize occasionally if they do not come up to our expectations. But when one of our faithful becomes ill, we rush him flowers; and if a demise occurs, we stand around and talk about what a wonderful man he was.

I am very happy to say that the Council through the virtue of its authority from the House of Delegates has seen fit to render a citation to a man who has done noble service, who has arrived at an age when he should be assisted, where we can still use his counsel, but when a younger man should bear the burden.

This citation has been prepared and designed to express our appreciation to Dr. L. L. Sogge, who has for so many years contributed in so many ways to our Association. I would like to read it now.

Be it known by virtue of the authority vested in the Council of the Minnesota State Medical Association by its House of Delegates that this citation is hereby awarded to you, Dr. Ludwig L. Sogge, in recognition of your service to your colleagues and to the people of this state in supplying advice and leadership in maintaining the high standards of medicine. It is known that you, at personal sacrifice, have given much of your time during the past twenty-three years in directing the activities of the Committee on Public Policy. The years of service entitle you to some relief of that responsibility and to the honorable position of counselor to the Committee on Public Policy. Doctor Sogge, we all commend you for this extraordinary service that you have given, which has been exemplified by your high ideals, your understanding of human nature, your honest, frugality, loyalty and patience.

The citation is signed by F. J. Elias, M.D., Chairman of the Council; A. E. Cardle, M.D., President; and B. B. Souster, M.D., secretary.

I hereby take pleasure in presenting this citation to you, Dr. Sogge. *(Applause.)*

At the request of Dr. Sheppard, the House arose and applauded Dr. Sogge.

Dr. Sheppard then asked Dr. F. J. Elias, Duluth, for the report of the Chairman of the Council.

Report of the Council

DR. ELIAS: The first meeting of the Council in connection with the Ninety-fifth Annual Meeting of the Minnesota State Medical Association was held at 2 p.m. on Saturday, June 5, 1948, for the transaction of routine business. Minutes of the previous meetings were approved and financial reports were submitted and accepted.

An opinion from Mr. G. S. Schuster, investment counselor for the Association, was read by the Finance Committee Chairman, which stated that an analysis of the audit of the Minnesota State Medical Association investment portfolio revealed its present position to be conservative.

The President of the Minnesota Heart Association appeared before the Council and presented a proposal to place plastic hearts in physicians' offices during the month of February as a method of collecting funds to promote the Association's objectives: dissemination of knowledge to the profession and laity concerning heart disease; stimulation of research in cardiovascular disease and development of postgraduate medical education courses. The proposal was referred to the House of Delegates.

The Chairman of the Insurance Liaison Committee introduced a proposed brochure which the Committee had developed in conferences with a representative committee from commercial insurance carriers operating in Minnesota. The Chairman of the Committee was instructed to revise the brochure, confining it to a statement of minimum standards which medical insurance contracts sold by insurance companies must meet to receive the approval of the Committee and that all reference to the Minnesota State Medical Association be deleted except insofar as is necessary to refer to the Insurance Liaison Committee as a Committee of the Association which is co-operating in a program to raise the standards of benefits of prepayment medical insurance contracts sold in Minnesota.

Applications for Affiliate Membership were approved for Dr. Margaret I. Smith, Robbinsdale; Dr. Peter Boysen, formerly of Pelican Rapids; and Dr. P. H. Benion, Saint Paul. Life Memberships were approved for Dr. Clarence W. Taylor of Duluth and Dr. O. H. Hegge of Austin.

The Council adjourned for dinner at 5:45 p.m. and re-convened in the Spanish Room at 7 p.m. for the completion of routine business.

*In accordance with action by the Council of the Minnesota State Medical Association in 1944, publication of the proceedings of the House of Delegates is limited to summary.

A resolution from the Chairman of a special committee to study the question of rebates was introduced.

A committee was appointed to study the question of the State Association's interpretation of the term "clinic" in connection with group practice and to confer with the American Medical Association and the Council on Economic Research, both of which are working on definitions of the term, and report back to the Council.

The appointment of Dr. Charles E. Proshek of Minneapolis to succeed Dr. T. H. Sweetser, who has resigned as the Chairman of the Committee on State Health Relations, was approved.

The appointment of Dr. Theodore Catlin of Buffalo and Dr. Frederick L. Schade of Worthington on the Advisory Board to the Minnesota Department of Health under the hospital licensing law, was approved by the Council. Dr. Thomas E. Broadie of St. Paul was approved for reappointment on the Advisory Board to the Health Department under the hospital superintendent registration law.

A report was introduced from the Sub-Committee appointed by the Committee on Tuberculosis to draft a statement concerning the use of BCG as set forth in the minutes of the meeting of the Tuberculosis Committee, held February 6, 1948, for referral to the proper Reference Committee, whereupon the Council recommended its referral to the Reference Committee on Officers and Council Reports. The meeting of the Council was adjourned at 9:30 p.m.

The second meeting of the Council in connection with the Ninety-fifth Annual Session was held at 9 a.m., Sunday, June 6.

The Chairman of the Committee on Cancer appeared before the Council and outlined a project proposed by the Committee in conjunction with the Cancer Control Division of the Minnesota Department of Health to provide a Cancer Education Service, co-sponsored by the Cancer Committee, Minnesota State Medical Association; Medical School, University of Minnesota, the Health Department and the Minnesota Division of the American Cancer Society.

The project is described as follows:

A PROJECT TO BE KNOWN AS THE CANCER EDUCATIONAL SERVICE OF THE CANCER COMMITTEE OF THE MINNESOTA STATE MEDICAL ASSOCIATION

Purpose—To establish a Cancer Educational Service which would be readily available to Minnesota county medical societies, hospital staffs and individual physicians.

Consultants—A group of recognized specialists who are qualified to give authoritative opinion on some phase of cancer diagnosis or treatment, selected by the Cancer Committee from volunteers. this group may be added to at any time to include physicians for special problems.

Plans—The Cancer Educational Service will offer three types of service without expense to local physician, hospital staff or county society.

(a) A team of from three to five members of the Cancer Educational Service will be offered to any component society of the Minnesota State Medical Association for a one-day cancer institute.

(b) One or possibly two members of the Cancer Educational Service will be available to meet with any hospital staff in the state, no matter how small, for an afternoon or evening cancer discussion.

(c) A free cancer correspondence service for physicians wishing information regarding any problem in a specific cancer case. Inquiries will be referred to a member of the Cancer Educational Service who seems best qualified to answer. Names of physicians making the inquiry will not be divulged and the opinion of the cancer consultant will be forwarded to the inquiring physician. Inquiries of special interest and the consultant's opinion will be published in MINNESOTA MEDICINE from time to time, without using names of physician or consultant.

Headquarters—The office of the Minnesota State Medical Association shall be the headquarters of the Cancer Educational Service of the Cancer Committee.

Operation—The Cancer Educational Service will be carried on under the direction of the Cancer Committee of the State Medical Association. All communications relative to this service shall be mailed out on special stationery of the Minnesota State Medical Association Cancer Committee, carrying the address of the State Medical Association headquarters in St. Paul. The Cancer Control Division of the Minnesota Department of Health will finance a secretarial service to aid in the operation of the Educational Service. This secretarial service will take care of scheduling the consultants for county medical society and hospital staff meetings. Also this service will submit correspondence inquiries to the selected consultant and transmit the reply to the inquiring physician. The Cancer Control Division of the Minnesota Department of Health will aid the Cancer Committee in every way in promoting and carrying out these institutes and staff meeting conferences.

Financing—This service will be principally financed through funds of the Cancer Control Division of the Minnesota Department of Health, but other organizations, such as the Minnesota Division of the American Cancer Society may also contribute to this service. Consultants will be paid an agreed stipend for the services rendered.

* * *

The Council approved this project subject to the declared principles that clinical material shall be used solely for educational purposes and the recommendation that the use of cancer teams be arranged through officials of component medical societies only.

A letter of resignation addressed to the Council by Dr. A. W. Adson as a member of the American Medical Association House of Delegates from Minnesota was read and accepted.

The Council approved a motion to place in nomination the name of Dr. J. A. Bargen, Rochester, as a nominee for membership in the AMA House of Delegates from Minnesota at the expiration of Dr. Adson's present term.

The Council recommended the nomination of Dr. W. A. Coventry to succeed himself as a member of the AMA House of Delegates from Minnesota.

The nominations of Dr. W. L. Burnap, Fergus Falls, and Dr. J. C. Hultkrans, Minneapolis, to succeed themselves as alternate members of the AMA House of Delegates from Minnesota were approved by the Council.

The Council voted to endorse unanimously the candidacy of Dr. A. W. Adson of Rochester for the office of President-Elect of the American Medical Association. *(Applause.)*

* * *

With the recommendation that the question of the resolution on rebates presented in the Council report be laid on the table for further action, the House of Delegates approved the report of the Chairman of the Council.

Speaker Sheppard then called for the report of the Finance Committee from Dr. R. L. J. Kennedy, Rochester, Chairman.

Report of the Finance Committee

DR. KENNEDY: The wisdom and good judgment of the preceding Finance Committee continues to be confirmed by the present financial condition of the Minnesota State Medical Association. Although it appears to be satisfactory, there is evidence that the Association is operating on a narrower financial margin in respect to income and expenses than it has during recent years. The increase of income from dues from an increased membership has been more than offset by mounting costs of supplies and of help, by additional expenses due to increased activities of various committees and by decreased income from the annual meetings, due to increased costs of installation of exhibits.

The investment portfolio of the Association has undergone little change. The conservative policy that has been followed in the past continues to be reliable. The advice of experts in the field of investment is to maintain the portfolio as it has existed for the past two years.

Financial conditions during the past year have again emphasized the importance of maintaining a strong reserve position. In the opinion of the members of the

Finance Committee, the investment fund of the Association is not large and with world affairs as unsettled as they are at present, weakening of the reserve position should be avoided.

The State Medical Association continued the financing of the Veterans Medical Service Division during the year 1947. Anticipating the financial relationship of the State Medical Association to the Veterans Medical Service Division for the year 1948, it may be stated that the repayment of funds advanced to the Veterans Medical Service Division has already begun.

During the past year the Association implemented a group insurance plan which was developed by the Northwestern National Life Insurance Company for the active members of the State Medical Association. The State Medical Association will be reimbursed for expenses that were incurred at the end of the year 1948. For various reasons all of the component societies did not qualify for participation by their members in this insurance program. In the opinion of the members of the Finance Committee, the insurance program is highly desirable, and it is hoped that by the time of the next annual insurance date the rest of the component societies will have qualified for participation and that the insurance company will make it possible for the members of such component societies to enjoy the benefits of this program.

The Finance Committee wishes to acknowledge indebtedness to the Executive Secretary of the Association and to his staff for the aid received throughout the year and the help in preparation of reports on the financial status of the State Medical Association.

The members of the Finance Committee in addition to the Chairman are: Frank J. Elias, M.D., Ernest M. Hammes, M.D., A. E. Cardle, M.D., *ex officio*.

* * *

The House of Delegates accepted the report of the Finance Committee, as presented.

The Delegates next heard a comprehensive report of the findings of a special committee, appointed at the 1947 meeting of the House, to investigate insurance contracts, disability features and group life insurance. Presenting the report was Dr. Thurston W. Weum, Minneapolis, Chairman. The report was accepted by the House.

Reports of Reference Committees

The next order of business was the reports of the various reference committees. The Speaker called first upon Dr. H. M. Carryer, Rochester, Chairman of the Reference Committee on Medical Education Reports.

Medical Education Reports

DR. CARRYER: Your Reference Committee on Medical Education Reports met at 10 a.m. June 6, 1948. The following Medical Education Reports were considered:

Committee on Cancer—A. H. Wells, M.D., Duluth, Chairman
Committee on First Aid and Red Cross—J. S. Lundy, M.D., Rochester, Chairman.
Heart Committee—F. J. Hirschboeck, M.D., Duluth, Chairman
Committee on Hospitals and Medical Education—H. S. Diehl, M.D., Minneapolis, Chairman
Committee on Public Health Nursing—Mario McC. Fischer, M.D., Duluth, Chairman
Committee on Syphilis and Social Diseases—Paul A. O'Leary, M.D., Rochester, Chairman
Committee on Tuberculosis—J. A. Myers, M.D., Minneapolis, Chairman
Committee on Vaccination and Immunization—Robert N. Barr, St. Paul, Chairman

Certain items concerning these reports were considered worthy of comment. The Reference Committee on Medical Education Reports was pleased to note the report of the Committee on Hospitals and Medical Education which was submitted by Dr. Diehl. It was especially significant in that those primarily concerned with the training of medical students have emphasized an indoctrination for the general practice of medicine. A policy of providing "general practice internships" will better equip a medical student for the general practice of medicine, and will also provide a more adequate foundation for those wishing training in the various medical specialties. It was felt that the quality of medicine, as it is practiced in the state of Minnesota can only be enhanced by the trend now evident in medical teaching in this state.

The Committee on Medical Education Reports is impressed by the splendid record of achievement of these several committees, the reports of which were reviewed at this meeting. I move the adoption of these reports.

* * *

After some discussion, the House voted to adopt the report of the Reference Committee on Medical Education Reports. Dr. Sheppard called next for the report of the Reference Committee on Miscellaneous Scientific Reports, Dr. J. F. Borg, St. Paul, Chairman.

Miscellaneous Scientific Report

DR. BORG: Your Committee has carefully considered the following reports:

Committee on Anesthesiology—R. C. Adams, M.D., Rochester, Chairman
Committee on Child Health—G. B. Logan, M.D., Rochester, Chairman
Committee on Diabetes, J. R. Meade, M.D., St. Paul, Chairman
Committee on Fractures—E. T. Evans, M.D., Minneapolis, Chairman
Committee on General Practice—R. H. Creighton, M.D., Minneapolis, Chairman
Historical Committee—M. C. Piper, M.D., Rochester, Chairman
Committee on Industrial Health—L. S. Arling, M.D., Minneapolis, Chairman
Committee on Maternal Health—J. J. Swendson, M.D., St. Paul, Chairman
Committee on Medical Testimony—E. M. Hammes, M.D., St. Paul, Chairman
Committee on Military Affairs—J. H. Tillisch, M.D., Rochester, Chairman
Committee on Nervous and Mental Diseases—W. P. Gardner, M.D., St. Paul, Chairman
Committee on Ophthalmology—T. R. Fritsche, M.D., New Ulm, Chairman
Committee on Public Health Education—S. H. Baxter, M.D., Minneapolis, Chairman
Radio Committee—R. M. Burns, M.D., St. Paul, Chairman
Speakers' Bureau—F. J. Heck, M.D., Rochester, Chairman

Your Committee approved the above reports with the following qualifications:

Your Committee approves the report of the Committee on Anesthesiology, but recommends that it communicate with the Committee on Anesthesiology and state that it is suggested that it be the recommendation of the House of Delegates that it include in its program and its aims the encouragement of the training of nurses for anesthesia administration in such locations as it is necessary to use them. This Committee suggests that the Committee on Anesthesiology also encourage the inclusion of proper training in anesthesia of all students in the curriculum of the Medical School of the University of Minnesota.

Your Committee accepts the report of the Historical

Committee and recommends that the Council take favorable action on the suggestion that the material prepared to date be published. It is also recommended that Dr. Piper be given opportunity to express before the House of Delegates in connection with the submission of this report developments concerning this project.

Your Committee recommends the acceptance of the recommendations of the Committee on General Practice exclusive of paragraphs two and five, which are debatable, and it is suggested that these paragraphs be brought before the House of Delegates for discussion. It is also suggested that these recommendations be transmitted to the Dean of the Medical School as representative of the consensus of the Committee on General Practice.

Your Committee respectfully moves the approval of these reports.

Dr. Piper was then called upon to elaborate on the discussion of the proposal to publish the material on medical history in Minnesota. Following his discussion, it was moved that the House of Delegates authorize the Council to proceed to work out arrangements for the publication of the first volume of the History of Medicine in Minnesota, that the Historical Committee should have the assistance of the Editing and Publishing Committee in editing the material and that the Executive Secretary be empowered to inquire of the State Medical Association whether they will subscribe to the pre-publication subscriptions to the volume. The motion was carried.

Dr. Jan H. Tillisch, Chairman of the Committee on Military Affairs, then outlined for the delegates the work of the AMA Council on National Emergency Medical Service, which is laying groundwork for a program to be set in motion in the event of another national emergency. He described nationwide activities in setting up state disaster committees and explained how the government is preparing for defense with the setting up of the National Resources Board which will control material and personnel for the military and for civilians if and when there is another war.

Dr. Tillisch told the delegates that in the event of war, or in connection with national defense plans, reserve officers of both the navy and army medical corps may be called in at any time at the discretion of the President and that inactive members of the naval reserve probably will not be called in without official permission of Congress.

Dr. Ralph H. Creighton, Chairman of the Committee on General Practice appeared before the House to explain and comment on the two paragraphs in question from the report submitted by his committee. Following the discussion over the two points: paragraph 2 suggesting that candidates for specialty training take preliminary training in general practice and paragraph 5 making it essential that hospitals establish rotating internships with integrated teaching programs before being granted AMA approval, the House voted to accept the Report of the Reference Committee on Miscellaneous Scientific Reports, with paragraphs 2 and 5 deleted and paragraph 5 to be referred to the Committee on Medical Education and Hospitals.

Officers' and Councilors' Reports

Dr. C. W. Moberg, Detroit Lakes, Chairman of the Reference Committee on Officers' and Councilors' Reports, was called upon next.

DR. MOBERG: Your Committee has considered the reports of the Officers and Councilors very carefully and has found them to be complete. . . . I would now like to take up each report considered and make a few comments.

As regards the report of the Secretary and Executive Secretary, your Committee was impressed with the volume of work that now flows through the state office. The report was excellent and complete. We recommend the acceptance of the report.

Next to be considered was the report of our Treasurer, Dr. W. H. Condit. We recommend that this report also be accepted. The report of the Chairman of the Council was very elaborate and complete. It contained several important matters meriting special consideration by the House.

The first matter we should like to call to the special attention of the Delegates is the recommendation that the matter of Rh typing be reconsidered. . . .

The next matter warranting . . . the special attention of the House is a recommendation made jointly by the Committee on Military Affairs and the Committee on First Aid and Red Cross, which was presented to the Council and is reported by the Council Chairman and referred to the House for action. These two Committees wish to be combined and become known as the Committee on Emergency Medical Service. Your Reference Committee requests that the House of Delegates consider this matter.

On specific referral to your Reference Committee by the Council at its meeting last night, the matter of BCG and its use in Minnesota was discussed in connection with the Chairman of the Council's report. (Dr. Moberg read a paragraph from the report of the Committee on Tuberculosis, which was being presented by the Committee as a substitute for the resolution passed by the 1947 House in regard to BCG.)

An important matter discussed in the Council report is that of publication of the minutes of the Council—in edited form—in MINNESOTA MEDICINE. We urge that the House consider this proposal pro and con. . . .

A final consideration in the Council Chairman's report, which the Reference Committee would like to direct to your attention, is discussed in the last three paragraphs. It is evident from this report that the activities of organized medicine in this state are rapidly expanding and that there is a great need for such expansion in view of the importance of maintaining an active public health and public service program by the state association. These increased activities place a burden upon the state office staff which is rapidly approaching a serious problem. It calls for some action from the House of Delegates as a whole to assume more of the responsibility. As suggested in the Council report, it might be wise to procure a competent assistant secretary to assume a fair share of the public relations work and to relieve the burden of some of the multiple details falling upon the state office at the present time.

In view of these considerations, your Committee respectfully recommends that sufficient assistance shall be provided for our state office to carry out its many activities and to secure additional personnel as needed to conduct these activities efficiently.

We further recommend that our annual dues be increased if needed to provide for the additional personnel. The amount of increase in dues should be a joint responsibility of the Finance Committee and the Council.

With these recommendations we have accepted the report of the Chairman of the Council and we move its adoption by the House.

Your Reference Committee has considered carefully each of the reports of the Councilors. We are of the opinion that many of the problems cited are local in nature and should be handled by the individual districts. But before recommending action on these reports, we should like to call attention to a couple of details. The first is that of the importance of ALL LOCAL SOCIETIES notifying the District Councilor of ALL MEETINGS so that he may have an opportunity to be present. Thus, there can be maintained the closest possible contact between the Council and the component county medical societies within the Association.

The Councilor of the Fifth District reports that since there are only five county members in the Dakota County Medical Society and that most of the members in that attend meetings with Ramsey or Hennepin or Goodhue Counties, and some have joined nearby societies, that the Dakota County Medical Society be permitted to dissolve should it desire to do so in order that its members may officially join the medical society which is nearest and most convenient for them.

Your Committee now wishes to recommend the adoption of the Councilor reports, and I so move. This includes the following reports:

First District—R. L. J. Kennedy, M.D., Rochester
Second District—L. L. Sogge, M.D., Windom
Third District—L. G. Smith, M.D., Montevideo
Fourth District—A. E. Sohmer, M.D., Mankato
Fifth District—E. M. Hammes, M.D., St. Paul
Sixth District—O. J. Campbell, M.D., Minneapolis
Seventh District—W. W. Will, M.D., Bertha
Eighth District—W. L. Burnap, M.D., Fergus Falls
Ninth District—F. J. Elias, M.D., Duluth

Dr. Sheppard, following a motion to accept the Report of the Reference Committee on Officers' and Councilors' Reports, opened the report for discussion. The first to address the House was Dr. Kano Ikeda, St. Paul, speaking for the Minnesota Society of Clinical Pathologists and other pathologists of the state. He asked that the resolution passed by the 1947 House of Delegates that the State Department of Health be required to do Rh typing be rescinded. After a lengthy discussion, the House voted to rescind its previous action.

The next item to be considered was Dr. H. C. Hinshaw's report as to accepting his statement on BCG in lieu of a resolution passed by the House in 1947. Following a brief discussion, the statement prepared by Dr. Hinshaw was referred back to the Reference Committee on Medical Education Reports for further consideration. The Committee was requested to report back to the House following its discussion of the statement on BCG.

It was next ordered by the House that the matter of increase of dues should be further studied.

The next matter to be considered was the merging of the Committees on Military Affairs and First Aid and Red Cross into one committee to be known as the Committee on Emergency Medical Service. The motion to combine these two committees was lost.

The meeting of the House was recessed at 5:40 p.m.

Second Meeting, Sunday, June 6, 1948

Gold Room, Hotel Radisson
Minneapolis, Minnesota

The House of Delegates reconvened at 8 p.m. The first person to address the House was Dr. William F. Braasch, Rochester, who introduced to the Delegates Mr. Harold E. Stassen, former Governor of Minnesota, and candidate for the Presidency of the United States.

Mr. Stassen addressed the House in regard to his candidacy, stating his position with regard to health and government in America. He thanked the medical profession for its support of his candidacy, reviewed some of the work which he had carried on with the physicians of the state during the period while he was governor and pledged that in the event he should be elected president, he would never permit a law to become an act with his signature which affects medicine or health that is not approved by the American medical profession.

Following Mr. Stassen's address, the Credentials Committee reported that a quorum was present.

The next item of business was a report from Mr. Jarle Leirfallom, director of the Division of Social Welfare.

Mr. Leirfallom expressed appreciation of the Division to the doctors of Minnesota for the services to the indigent during the year. He told of meeting with the Association Medical Service Committee for the purpose of discussing the fee schedule for care of indigents. He said that he was impressed with the thoughtful and co-operative attitude of the Committee and he reported that the increase in fees was acceptable to the Division which is cognizant of the need for such an increase.

He urged the activation of all medical advisory committees throughout the state since they are of immense value to the Division in its work. He discussed briefly the program for service to crippled children and reported that it is felt generally that the program is a successful one.

Mr. Leirfallom expressed regret over the loss of the services of Dr. Edwin J. Simons, who resigned as chief of the medical services unit during the year. He said that the Division was very fortunate in securing Dr. F. F. Callahan for that post and that Dr. Callahan was doing an excellent job.

Dr. A. W. Adson, Rochester, Chairman of the Medical Service Committee which was responsible for negotiating with the Division of Social Welfare in the matter of fees for care of indigents, spoke briefly regarding the proposed upward revision of fees. He also emphasized the need for county medical advisory committees.

Dr. Sheppard then called upon Dr. O. I. Sohlberg, St. Paul, who reported on the activities of Minnesota Medical Service, Incorporated, of which he is President. Dr. Sohlberg said that Minnesota Medical Service was incorporated on January 10, 1947, and that its By-Laws, adopted, February 1, 1947, were approved by the Attorney General on April 27, 1947. The plan, now known as "Blue Shield," Dr. Sohlberg said, began enrolling subscribers on November 15, 1947, although official inauguration ceremonies were not held until April 12, 1948. At the ceremonies, held at Northrop Memorial Auditorium on the campus of the University of Minnesota, Dr. Paul R. Hawley, formerly of the Veterans Administration and now head of the national Blue Shield-Blue Cross Commission, was the principal speaker. Attending were some 800 doctors, civic leaders and government officials, Dr. Sohlberg reported.

As of May 1, Dr. Sohlberg said, a total of 2,101 doctors were enrolled as participants and over 21,000 persons were covered. The financial condition of Blue Shield, he said, is healthy; and he expressed the belief that it would continue to prosper.

A brief question-and-answer period followed, at which Dr. Sohlberg and Mr. Arthur M. Calvin, director of Blue Cross and acting director of Minnesota Medical Service, Incorporated, answered questions from the floor of the House.

Next to be heard was the report of the Minnesota State Board of Examiners in the Basic Sciences, given by Dr. Raymond N. Bieter, Minneapolis, Secretary-Treasurer. Following Dr. Bieter's report, Dr. Julian F. DuBois, Secretary, Minnesota State Board of Medical Examiners, presented a report of the Board's activities.

Dr. J. I. Fitzsimmons, Assistant Medical Director, Veterans Administration Branch Office No. 8, Fort Snelling, addressed the delegates briefly regarding the medical phases of the VA program. He reported that the Veterans Medical Service program, known as the Home-Town Medical Care program, which has been functioning for a year and a half, has proved satisfactory to the Veterans Administration. He thanked the medical profession for its assistance in the past and expressed the hope that it will continue to assist the Veterans Administration in the future.

Major Arthur Tarrow, Professor of Military Science and Tactics, University of Minnesota, spoke to the Delegates in regard to a program which the army has inaugurated to increase the number of physicians to care for an augmented peace-time army.

Next to be presented was the report of the Minnesota Hospital Construction and Planning Program, given by Dr. Helen L. Knudsen, Director.

Dr. Knudsen reported that Minnesota became eligible for federal aid in the construction of a number of hospitals with the approval of the Minnesota Plan on March 5, 1948. The State Board of Health is responsible for planning and construction phases of the program, she said.

According to present plans, Dr. Knudsen said, the completion of the Minnesota hospital building program will bring the majority of the population within an approximate radius of 20 miles of a hospital. Dr. Knudsen also outlined plans regarding mental disease hospitals, tuberculosis hospitals, chronic disease hospitals and public health centers.

The Hospital Survey and Construction Act authorizes an annual grant of $1,655,175 over a five-year period to assist in building needed hospitals and public health centers in Minnesota, according to Dr. Knudsen. Plans are to use the first year's funds mainly for general hospitals, with one institution being built in each of the public health center and chronic disease hospital categories. Federal funds constitute one-third of the total cost of the program, Dr. Knudsen said.

A brief report from Dr. A. J. Chesley, Secretary and Executive Officer of the State Department of Health, followed Dr. Knudsen's talk.

A report from the University of Minnesota Medical School was then presented by Dr. M. M. Weaver, Assistant Dean, after which Dr. George N. Aagaard, recently appointed Director of Postgraduate Medical Education, was presented to the Delegates.

Dr. William F. Braasch, Rochester, a member of the Board of Trustees of the American Medical Association, told the Delegates about some of the work being done by the Board and the problems facing the Board, covering the extension of prepayment medical care plans, participation in the National Health Assembly, and the mid-winter meeting of the AMA House of Delegates to be held in St. Louis.

The discussion of the report of the Reference Committee on Officers' and Councilors' Reports was then resumed by the House. Dr. Sheppard opened the discussion on the matter of publication of edited reports of Council proceedings in MINNESOTA MEDICINE.

A motion to mimeograph the edited Council reports and distribute them to the Secretaries of the component medical societies was passed by the Delegates in lieu of publication of these proceedings in MINNESOTA MEDICINE.

Dr. Elias presented a report of a meeting of the Council, held following the afternoon meeting of the House of Delegates, at which the question of dues and rebates were discussed. Dr. Elias reported as to regulations in the Constitution regarding the fixing of Association dues, which require that "the annual dues shall be determined by the House of Delegates, but shall not exceed the sum of twenty dollars per capita per annum except on a two-thirds vote of the Delegates present." It was suggested at the Council meeting, Dr. Elias reported, that this portion of the Constitution be amended to read "thirty dollars." However, the Constitution, it was reported, prescribes the manner of amendment so as to require the publication of the proposed amendment and the submission of the proposed amendment to the membership not less than three months prior to the House of Delegates meeting at which action is to be taken.

Lack of a quorum prohibited further action. The House of Delegates recessed at 10:55 p.m. to reconvene the following day at 12:15 p.m.

Third Meeting, Monday, June 7, 1948

Gold Room, Hotel Radisson
Minneapolis, Minnesota

Following a luncheon at 12:15 p.m., the House of Delegates reconvened at 1:30 p.m. with Dr. Sheppard presiding. Dr. Donaldson reported that a quorum was present.

The first item of business was the resumption of the Officers' and Councilors' reports, with a report from Dr. Haddon M. Carryer's Reference Committee on Medical Education Reports to which was referred the question of BCG. Dr. Carryer presented the following resolution on BCG:

WHEREAS it is a well known clinical fact that tuberculosis is a disease against which the human body frequently cannot develop strong, dependable and permanent immunity and

WHEREAS the use of BCG vaccine is authoritatively reported to provide a relative immunity of varying degree and duration, and

WHEREAS the American Trudeau Society, after extensive consideration, has said "BCG vaccine, prepared under ideal conditions and administered to tuberculin negative persons by approved techniques, can be considered harmless," be it therefore

RESOLVED that the House of Delegates of the Minnesota State Medical Association approve the use of BCG vaccine in the state of Minnesota,

1. PROVIDED that its use be limited to those persons with negative tuberculin skin test reactions who may be exposed to unusual hazards of tuberculous infection greater than the danger experienced by the general population, and
2. PROVIDED that vaccination be carried out under conditions which permit prolonged observation of all vaccinated persons and
3. PROVIDED that the vaccine employed be obtained from the laboratories approved by the United States Public Health Service or the Minnesota State Board of Health, and
4. PROVIDED that all instances of persons vaccinated with BCG shall be reported to the Minnesota State Board of Health, and
5. PROVIDED that recognition be given to the fact that the use of BCG vaccine is not a substitute for accepted methods of tuberculosis prevention and control, and should not lead to a relaxation of such precautions.

The House of Delegates voted to accept this resolution in lieu of the resolution on BCG passed by the 1947 House.

Dr. Carryer reported that his Committee had studied the question of the advisability of placing plastic hearts in physicians offices during the month of February, a matter previously referred by the House to the Committee on Medical Education Reports, and had concluded that the plan could be adopted, provided it was carried out with the approval of the county medical society and the individual physician in whose office the funds are to be solicited. The House voted to approve the plan.

Dr. Elias then presented the matter of dues and reported further action by the Council on the matter. Dr. Elias reported that in view of the necessity of publication and notification three months in advance of any action to be taken with regard to amending the Constitution, the Council wished to recommend that a special assessment of ten dollars be allowed, commencing the first of next year, January, 1949. Dr. Elias stated that this should take care of the program of increased activities until such time as the Constitution could be properly amended.

The House of Delegates then voted to accept the report of Dr. Elias for the Council, and, at the suggestion of the Chairman of the Finance Committee, a second motion was made and passed accepting the special assessment for 1949 dues. That concluded the material covered in the Report by the Reference Committee on Officers' and Councilors' Reports. A motion was passed by the House accepting the Report.

* * *

Dr. Sheppard called upon Dr. F. W. Behmler of Morris for the report of the Reference Committee on Medical Economics Reports.

Medical Economics Reports

DR. BEHMLER: The Reference Committee on Medical Economics Reports met yesterday with all members present. After studying the report of the Editing and Publishing Committee, approval was given, with a special commendation for the valuable work of Mr. J. R. Bruce as Business Manager and Dr. Carl B. Drake as Editor of MINNESOTA MEDICINE. Mr. Speaker, I move the adoption of the report. (The Delegates voted approval.)

The Reference Committee approves the report of the Committee on Interprofessional Relations without further comment. (House approved the report.)

The Reference Committee approves the report of the Medical Advisory Committee and also commends the Committee on the formation of the Joint Grievance Committee. (House approved report.)

After studying the report of the Committee on Medical Economics, we approve the report and wish to commend the Committee on its continued effort to preserve our present system of medical care. (House approved report.)

The Reference Committee approves the report of the Committee on Medical Ethics with no comment. (House approved report.)

The Reference Committee also approves the report of the Committee on University Relations with no comment. (House approved report.)

The Reference Committee thoroughly considered the report of the Committee on Public Policy. The Committee heartily approves the reorganization of the Committee on Public Policy with the increase in membership. It also gives 100 per cent approval of its five point program. . . .

We believe that a Public Relations Counsel should be obtained either on a full-time or extensive part-time basis. An active program on public relations should be carried out by the Minnesota State Medical Association immediately. . . . We wish to emphasize the need and value of the county health unit bill and urgently recommend a study of this question of county units by a committee of the Council, to be presented to our Public Policy Committee.

Following the acceptance by the House of the report of the Committee on Public Policy, the report of the Reference Committee on Medical Economics Reports was complete. The next item of business was the report of the Reference Committee on Miscellaneous Medical Economics Reports, Dr. F. L. Schade, Worthington, Chairman.

The House accepted the five reports considered by the Committee, with the recommendations as follows:

Insurance Liaison Committee—A. W. Adson, M.D., Rochester, Chairman

Committee on Medical Service—Dr. Adson, Chairman, with the suggestion that a study be made of the optical code used by the State Welfare Board.

Committee on Rural Medical Service—Paul C. Leck, M.D., Austin, Chairman

Committee on State Health Relations—T. H. Sweetser, M.D., Minneapolis, Chairman, with the recommendation that a study be made of the coroner situation, particularly in rural areas of the state.

Committee on Veterans Medical Service—R. H. Creighton, M.D., Minneapolis, Chairman, with the recommendation that the attention be again called to the importance of enrolled physicians' filing and promptly returning all VA forms in connection with treatment rendered veterans.

It was subsequently moved by the House that the Committee on Rural Medical Service should study the township system with regard to the care of indigents with the purpose of finding a better method for providing medical care for these unfortunates, perhaps replacing them with a good county welfare board system.

Next was the report of the Resolutions Committee, Dr. R. R. Cranmer, Minneapolis, Chairman.

DR. CRANMER: WHEREAS the weekly broadcast on health conducted under the auspices of the Minnesota State Medical Association passed its twentieth anniversary on the air this year, and

WHEREAS the Minnesota State Medical Association has been very fortunate in securing the services of Dr. Stewart C. Thomson, Associate Professor of Public Health of the University of Minnesota, as speaker on these broadcasts, and

WHEREAS station WCCO has carried this program without cost to the Association during these many years, now be it therefore

RESOLVED that this House of Delegates express its deep appreciation to Dr. Thomson and to station WCCO for their splendid contributions in making these public health education programs possible.

The thanks and appreciation of the House of Delegates is hereby extended:

To the officers and members of the Hennepin County Medical Society, the Hennepin County Medical Auxiliary and its Committee on Local Arrangements for their services and co-operation in making possible this fine Minneapolis meeting;

To the management of the Hotel Radisson and all of the hotels in Minneapolis for courtesies extended to our guests;

To radio stations WCCO, KSTP, WLOL, WDGY and WCTN, and their staffs, for making possible the fine schedule of broadcasts arranged in connection with the meeting; and

To the Minneapolis *Morning Tribune*, the Minneapolis *Star* and the Saint Paul *Dispatch-Pioneer Press* for their excellent reporting of scientific sessions held in connection with this meeting and for their generous contributions of space to advance announcements.

* * *

RESOLVED that the House of Delegates of the Minnesota State Medical Association commend the renewed interest in, and the increased cognizance of the work which must be done in caring for inmates of the state institutions. It wishes particularly to commend the work being done by the Governor's Advisory Committee on Mental Health and to urge the continuance of this project.

It is requested that if this resolution is adopted that a copy of it be forwarded to the Chairman of the Governor's Advisory Committee on Mental Health.

* * *

RESOLVED that the House of Delegates go on record as supporting the Council on Emergency Medical Service of the American Medical Association in its efforts to secure medical representation on the National Resources Planning Board; and be it further

RESOLVED that this action of the House of Delegates be brought to the attention of the Council on Emergency Medical Service of the American Medical Association and other official bodies as may be necessary to implement this resolution.

* * *

BE IT RESOLVED by the House of Delegates of the Minnesota State Medical Association that the medical faculty of the University of Minnesota be cognizant of the predicament of non-metropolitan areas of the state which lack well-qualified practitioners in Eye, Ear, Nose and Throat. This is the result of the rigid division of training for specialization in either Eye *or* in Ear, Nose and Throat. Minnesota is predominantly a rural state—in area and in population—and the need for these services in the rural areas is becoming more acute.

BE IT FURTHER RESOLVED that the Medical Faculty of the University of Minnesota be urged to investigate this undesirable situation and find means in their training curriculum to rectify it.

The House of Delegates approved all of the above resolutions, thus completing the report of the Resolutions Committee.

Dr. Sheppard then called upon Dr. Elias, Chairman of the Council, for a final report from the Council.

DR. ELIAS: In reporting on the activities of the Council since the session of the House of Delegates last night, your Chairman wishes to state that the members of the Council were guests of the officers and members of the Board of Directors of Minnesota Medical Service at a breakfast meeting at 7:30 this morning. This was the first annual business session of that organization.

(I might add that this was a very fine meeting and that the Council was in agreement with all of the work and proposals that the Service has engaged in up to this time.)

The Council withdrew from that meeting to convene at 10 a.m. for completion of discussions on the resolution regarding the question of rebates. I will now restate the resolution as it now stands for the action of the House of Delegates:

The Council hereby declares itself unalterably opposed to all forms of rebates and declares the acceptance of such as an unethical practice and grounds for disciplinary action by the county societies.

It is recommended that any practice which might give rise to public suspicion that a business arrangement exists between a commercial house and a physician be discontinued.

The Council assures the House of Delegates that it is fully aware of the serious damage to our public relations which has occurred due to the publicity given the government action against the members of our Association.

The Council will stay alert and will inform the county societies when it is timely to implement the above suggested action.

* * *

The House voted its approval of the report of the Chairman of the Council.

The next order of business was the reading of the names of members who died during the past year. Dr. M. C. Piper, Rochester, read the names of 55 physicians, after which a moment of silence was observed.

The next order of business was the election of officers. The following were unanimously elected by the Delegates:

President-Elect: E. M. Hammes, M.D., St. Paul

First Vice President: Charles E. Proshek, M.D., Minneapolis

Second Vice President: A. E. Sohmer, M.D., Mankato

Secretary: B. B. Souster, M.D., St. Paul (re-elected)

Treasurer: W. H. Condit, M.D., Minneapolis, (re-elected)

Speaker of the House: C. G. Sheppard, M.D., Hutchinson, (re-elected)

Vice Speaker of the House: H. M. Carryer, M.D., Rochester, (re-elected)

Councilor, Fourth District: H. J. Nilson, M.D., North Mankato

Councilor, Fifth District (to fill the unexpired term of Dr. Hammes): Justus Ohage, M.D., St. Paul

Councilor, Sixth District: O. J. Campbell, M.D., Minneapolis, (re-elected)

Councilor, Eighth District: W. L. Burnap, M.D., Fergus Falls, (re-elected)

Delegates to the American Medical Association: J. A. Bargen, M.D., Rochester, and W. A. Coventry, M.D., Duluth, (re-elected)

Alternates: J. C. Hultkrans, Minneapolis, (re-elected) and W. L. Burnap, Fergus Falls, (re-elected)

The final order of business was the selection of the meeting place for the 1949 Convention. The House of Delegates voted to accept the invitation from the Ramsey County Medical Society to hold the meeting in Saint Paul.

At 3:07 p.m. the Ninety-fifth Annual Meeting of the House of Delegates was adjourned.

SPECIAL FEATURES

At the annual banquet of the Minnesota State Medical Association, held Tuesday evening, June 8, 1948, at Hotel Radisson, Minneapolis, several Minnesota physicians were given special recognition.

Admitted to the Minnesota State Medical Association's *Fifty Club* were: Drs. Frank E. Burch, J. S. Gilfillan and Asa M. Johnson, St. Paul; Gerhard A. Dahl, Mankato; A. S. Fleming, A. E. Hedback, C. J. Lind, J. R. Peterson and N. H. Sheldrup, Minneapolis; W. F. C. Heise, Winona; J. G. Parsons, Crookston; W. B. Torgerson, Oklee; and L. A. Williams, Slayton.

The Southern Minnesota Medical Association Medal for the best scientific exhibit displayed at the meeting was awarded to Dr. Leonard S. Arling of Minneapolis, for his exhibit on "What Is Industrial Medicine?" Dr. Arling's exhibit was cited for its excellence from the standpoint of research, timeliness and scientific accuracy.

Honorable mention was made of the exhibits of Dr. Ralph X. Rossen, Hastings, "Radio-Encephalography," and Drs. Vernon L. Hart, Wesley H. Burnham and Stuart L. Arey, Minneapolis, "Congenital Displacement of the Hip Joint." Judging were Dr. Ernest M. Hammes, Sr., St. Paul; Dr. Harold L. Gainey, Kansas City, Kansas; and Dr. Sanford S. Sisson, Jacksonville, Florida.

Presentation of Distinguished Service Medal and Citation

In recognition of his many years of service to the people and to medicine in Minnesota, Dr. Albert J. Chesley, St. Paul, Secretary and Executive Officer of the Minnesota Department of Health, was awarded the Association's Distinguished Service Medal and Citation. Presentation was made by Dr. F. J. Elias, Duluth, Chairman of the Council. The presentation speech of Dr. Elias was as follows:

DR. ELIAS: Tonight I have the very great honor of paying tribute in behalf of the entire membership of the Minnesota State Medical Association to one of its most loyal members and devoted servants. No one will deny, I am sure, that his untiring efforts in behalf of Minnesota medicine and in behalf of all of the people of Minnesota, in fact, have earned for him the highest tribute we can pay.

A staunch advocate of the preservation of private enterprise in medicine, and elsewhere, he has behind him an enviable record of nearly half a century of outstanding service in the field of public health and social hygiene, not only in Minnesota but far beyond its borders and even abroad. In fact, as we have often said about him, it would be hard to visualize health and medical activities in Minnesota over the years since he took a hand in it, without him there.

A native son of Minnesota, he was educated at our State University and since first receiving his M.D. in 1907, he has in some way been serving medicine and public health in this state. Beginning as an assistant bacteriologist with the State Board of Health as his first full-time job, he has been working for the same agency ever since. For some twenty years he was also professor of public health at the University of Minnesota department of preventive medicine.

He also served in the First World War and even before that in the Spanish-American War and the Philippine Insurrection. In 1918-19 he went to France as public health expert for the American Red Cross. In 1919-20 he served as chief of staff for the Red Cross in Poland. In 1940 he guided and planned for welfare and health protection of guardsmen in Minnesota while they trained here in the Defense Program.

He has a record for being able to plan ahead—to see the job through. Evidence of this is seen throughout all of the social hygiene work developed under his direction. He was recognized only last year with the granting of an honorary life membership to him by the American Social Hygiene Association.

And so, at this time, the Council of the Minnesota State Medical Association wishes to award its 1948 Distinguished Service Medal to Dr. Albert J. Chesley. It is a very great honor and a pleasure to confer upon him at this time this citation and this medal of which he is so richly deserving.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

(Continued from Page 1124)

and the cases were set for trial for September 13, 1948. The defendant Olson, at the time of her arrest, was employed at a Minneapolis hospital. It was the claim of the State that the defendant Conry persuaded the defendant Olson to perform the abortion. No money was paid to defendant Olson for her services. Because of the extenuating circumstances in the case, in so far as the defendant, Lucille P. Olson was concerned, the State permitted her to plead guilty to an information charging her with the crime of practicing healing without a basic science certificate, instead of abortion. This plea was entered on September 22, 1948, before Judge Carroll, who imposed a sentence of one year in the Minneapolis Workhouse and, upon the recommendation of legal counsel for the Minnesota State Board of Medical Examiners, suspended the sentence and placed the defendant on probation for a period of three years.

Minnesota Academy of Medicine

Meeting of April 14, 1948

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, April 14, 1948. Dinner was served at 7 o'clock, and the meeting was called to order at 8:10 by the president, Dr. T. A. Peppard.

There were fifty members and four guests present.

Upon ballot, the following were elected as candidates for membership in the Academy: Dr. J. R. Aurelius, Saint Paul, and Dr. Clarence Dennis, University Medical School.

The scientific program followed.

TRANSMUTATION OF A MYELOID INTO A LYMPHATIC LEUKEMIA OR AN EARLY STEM-CELL UNDIFFERENTIATED LEUKEMIA

Case Report

J. A. LEPAK, M.D.
Saint Paul, Minnesota

The patient came under observation February 3, 1943, for high blood pressure and headaches of several years duration. She was fifty-three years of age, a housewife, married and had one child. One cousin had died of leukemia. The gall bladder, tonsils and teeth had been removed. Slight constipation was present. Menstruation had ceased at forty-seven and menopausal disturbances followed. She slept poorly, took three cups of coffee daily, and weighed 166 pounds.

The physical examination showed ears, eyes, nose and throat in good condition. An upper and lower denture was present. Over the base of the heart a rough systolic murmur was heard. The abdominal findings were normal. Slight varicose veins were present on both of the lower extremities. Blood pressure read systolic 220, diastolic 110 mm. of mercury. Urinalysis was negative. The blood showed hemoglobin 80 per cent, red blood count 4,340,000, and white blood count 8,850. The electrocardiogram showed only left ventricular preponderance.

She was advised to reduce weight gradually to 150 pounds. The blood pressure under this regimen gradually dropped, fluctuating from a systolic of 130 to 170 and a diastolic of 70 to 100 mm. of mercury. Menopausal symptoms disappeared, and she remained relatively well until December 29, 1944, when precordial pain appeared following a slight upper respiratory infection, and hospitalization became imperative. At the hospital the salient physical findings consisted of râles in both bases and a blood pressure of systolic 130, diastolic 80 mm. of mercury. The electrocardiogram revealed left ventricular extrasystoles, inverted T wave in lead II, low T in lead III with left axis deviation, suggesting myocardial damage. The x-ray picture of the chest showed thoracic osteoarthritis. The blood examination showed findings as recorded in Table I.

The sedimentation rate on December 30, 1944, was 84 mm. in one hour; on January 13, 1945, it was 55 mm. She was discharged from the hospital on January 17, 1945, with a diagnosis of myelogenous leukemia. Thereafter, the blood was examined from time to time, with the findings as recorded in Table II.

After the blood examination on March 4, 1946, x-ray therapy was advised. She chose the Mayo Clinic and remained under Dr. H. C. Giffin's observation and treatment from April 1, 1946 to April 13, 1946. He confirmed the diagnosis of chronic myelogenous leukemia and gave the following findings before treatment: Hemoglobin was 11.2 gm., erythrocytes 4,200,000, leukocytes 172,000. The platelets were 283,000. The differential count was: lymphocytes 1.0 per cent, monocytes 3.5 per cent, neutrophiles 54.0 per cent eosinophiles 0.5 per cent, basophiles 4.0 per cent myelocytes 9.5 per cent, metamyelocytes 10.0 per cent, promyelocytes 9.5 per cent, leukoblasts 7.5 per cent, stem cells 0.5 per cent. Blood smears were characteristic of myelogenous leukemia.

The edge of the spleen was palpable. A rough systolic murmur was heard over the base of the heart due to aortic sclerosis. Her blood pressure was systolic 190 to 210, diastolic 100 to 110 mm. of mercury. The eye grounds showed grade I narrowing of the arterioles.

TABLE I. BLOOD FINDINGS—MILLER HOSPITAL

	12-30-44	12-31-44	1-2-45	1-3-45	1-4-45	1-8-45	1-13-45	1-16-45
Hemoglobin	78				80	81	78	
Erythrocytes	4,120,000				4,370,000	4,330,000	4,140,000	
Leukocytes	60,800	86,000	88,000	85,000	86,000	74,000	60,000	89,000
Differential:								
Neutrophiles	75	86		65	61	83	60	
Lymphocytes	9	6		14	14	12	15	
Monocytes	1	4		5	5	3	4	
Eosinophiles	2	1		2	1	1	3	
Basophiles		3			1	1	1	
Myelocytes	3	12		2	3	12	2	
Promyelocytes	4	3		2	1	4	5	
Metamyelocytes					5		1	
Myeloblasts	6	1		10	9		9	

TABLE II

Date	Hemoglobin	Red Blood Count	White Blood Count
1-23-45	76	4,290,000	78,150
2-13-45	75	4,350,000	81,500
3-21-45	76	.....	103,000
4-10-45	68	.....	92,000
5-7-45	78	.....	98,000
5-28-45	..	.....	75,800
7-2-45	68	3,730,000	102,000
9-5-45	72	4,050,000	134,000
10-4-45	68	4,100,000	102,000
11-10-45	64	4,040,000	117,000
12-17-45	74	4,120,000	128,000
1-7-46	78	3,760,000	127,000
3-4-46	65	3,680,000	159,500

TABLE III

Date	Hemoglobin	Red Blood Count	White Blood Count
5-1-46	70	4,050,000	22,450
5-8-46	72	3,960,000	16,500
5-16-46	70	3,840,000	11,450
5-23-46	71	4,180,000	10,900
5-31-46	78	4,350,000	11,500
6-17-46	72	4,630,000	12,250
7-5-46	76	4,400,000	14,800
7-26-46	72	4,400,000	29,800
8-19-46	80	4,500,000	53,500
8-26-46	77	4,390,000	65,000
8-27-46	12.7 gm	4,720,000	64,000 Mayo
9-2-46	Concluded four x-ray treatments		25,100 Clinic
9-16-46	70	4,350,000	21,250
9-30-46	78	4,360,000	28,250
10-14-46	74	4,300,000	19,750
10-28-46	78	4,510,000	18,050
11-16-46	74	4,440,000	30,600
11-30-46	74	4,250,000	22,250
12-21-46	70	4,100,000	44,500
12-28-46	67	3,720,000	68,500
12-30-46			83,000 Mayo
1-8-47	Concluded six x-ray treatments		9,400 Clinic

TABLE IV

BLOOD FINDINGS—ST. JOSEPH'S HOSPITAL

Date	Hemoglobin	Red Blood Count	White Blood Count
1-21-47	50-55	3,480,000	227,000
1-22-47	..	..	143,000
1-23-47	..	..	134,000
1-24-47	47	2,590,000	108,000
1-25-47	..	..	99,000
1-26-47	..	..	92,000
1-27-47	35	2,710,000	110,000
1-28-47	..	..	113,000
1-29-47	45	2,180,000	133,900
1-30-47	..	..	64,000
1-31-47	33	1,760,000	46,000
2-1-47	..	..	50,000
2-2-47	..	..	41,000
2-3-47	50	2,400,000	89,000
2-5-47	47	2,560,000	95,000
2-7-47	58	2,820,000	109,000
2-10-47	50	2,470,000	206,000 Died

Her height was 59 inches and weight 148 pounds with clothing. Urinalysis was negative. Blood urea revealed 34. mg., and the blood Wassermann test was negative. X-ray showed calcification of the aorta. Electrocardiogram revealed slurred QRS in lead II, left axis deviation, inverted T in lead III.

After receiving eight x-ray treatments at the Mayo Clinic the leukocyte count dropped to 40,000 and she returned to Saint Paul. Then the blood was checked from time to time so that she might receive further x-ray treatment if the leukocyte count should reach 50,000. Table III shows briefly the dates, blood findings and x-ray treatments.

Returning home after the last x-ray treatment on January 8, 1947, gradual weakness became more and more pronounced. Nausea, vomiting, pallor, fever (104 degrees), sweating and ecchymoses appeared a few days later. These disturbances became worse, and she was sent to the hospital for further study and treatment on January 21, 1947. At the hospital, petechiae and ecchymoses increased, râles appeared in the chest and the mouth became very sore. In addition to the high fever she perspired freely and was restless. Blood transfusions, glucose and penicillin were given, but failed to stop the course of the disease. X-ray pictures of the chest were negative. On February 10, 1947, a right hemiplegia appeared, and a short time later the patient died.

The blood findings at St. Joseph's Hospital are shown in Tables IV and V and show a total absence of polymorphonuclear cells until the transfusions were started. After the transfusions were started, 1 to 4 polymorphonuclear cells appeared in the smears. There were five transfusions, the first on January 28, 1947 and the last on February 7, 1947.

A sternal puncture was performed on January 29, 1947, and showed the following findings; fat 3 per cent, plasma 64 per cent, myeloid layer 9 per cent, erythrocytes 24 per cent. The differential count revealed 96 per cent lymphocytes, of which many showed evidence of immaturity. An occasional granulocyte and normoblast was noted, and myeloblasts were present also. The pathologist made a diagnosis of lymphatic leukemia. Dr. Thomas J. Kenyon, formerly pathologist at St. Joseph's Hospital, concluded: "(1) The blood morphology indicates a leukemia of a lymphatic type. (2) In spite of the chronicity from the clinical standpoint, the morphology suggests an acute type."

TABLE V. DIFFERENTIAL COUNTS AND PLATELETS

Date	Polymorphonuclear	Basophiles	Small lymphocytes	Large lymphocytes	Monocytes	Early	Platelets
1-21-47			7	4		89	267,000
1-24-47			29	12	1	58	
1-26-47						..	25,000
1-27-47			13	3	2	82	
1-28-47			15			85	22,000
1-29-47			27	3	1	69	
1-30-47		1	2			97	
1-31-47			2		1	97	
2-1-47							20,000
2-3-47			1	4	2	93	238,000
2-4-47	4		2	3	1	90	139,000
2-7-47	1	1	12	4	8	74	142,000
2-10-47	1	1	18	4	5	71	

Discussion

Mixed leukemias have been reported by Turk, Hirschfeld, Naegeli, Browning, Herxheimer and Logefeil. This case, however, is not a mixed leukemia. It points, rather, to a retreat of the leukemic process to such an early stage in the usual course of leukemic development that the process could deviate readily and follow the lymphatic route and thus produce early lymphocytes indistinguishable from stem cells; or it is possible that these are early stem cells which could have become, if the patient had lived, either polymorphonuclear or lymphocytes.

The writer wishes to acknowledge his gratitude to the following pathologists and hematologists who studied either some or all of the blood findings:

Kano Ikeda, M.D., Pathologist, Charles T. Miller Hospital, Saint Paul, Minnesota

Thomas J. Kenyon, M.D., formerly Pathologist, St. Joseph's Hospital, Saint Paul, Minnesota

H. Z. Giffin, M.D., Clinical Section, Mayo Clinic, Rochester, Minnesota

C. H. Watkins, M.D., Clinical Section, Mayo Clinic, Rochester, Minnesota

Roy R. Kracke, M.D., Dean, Medical College of Alabama, Birmingham, Alabama

Hal Downey, M.D., Professor of Anatomy, University of Minnesota

E. T. Bell, M.D., Professor of Pathology, University of Minnesota

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ENHANCING EFFECTS OF PENICILLIN

E. S. PLATOU, M.D.

Minneapolis, Minnesota

Since the introduction of penicillin, the problem of its rapid absorption and excretion has occupied the attention of many workers. Biologic methods for determining plasma levels of penicillin brought about a more precise knowledge of the concentration of the drug, but the duration of effects on bacteria *in vivo* needs further study. Large losses in the urine were recognized early when shortages required recovery and re-use. The renal clearance of commercial penicillin is 750 c.c. to 1,200 c.c. per minute, approximating that of total renal plasma flow. When crystalline penicillin G or X is given intramuscularly in aqueous solution, 60 per cent of it can be recovered in the urine by the end of an hour. Blood levels fall off at the rate of approximately 70 per cent per hour after penicillins are given in aqueous solution intramuscularly. In spite of lower renal clearance, penicillin K yields relatively low plasma levels due to an organic combination with proteins which also lessens its potency. An effective plasma concentration of penicillin mixtures is presently thought to be about 0.03 units per cubic centimeter for most penicillin-susceptible organisms. Whether a sustained level above this arbitrary minimum or a periodic "peak" is preferable has been controversial. Persistently high concentrations have been assumed to be effective in combating unusual cases with fulminating or stubborn infection; a combination of constant and "peak" effects is believed by some to be even better.

Approaches to the problem of enhancing and prolonging the effectiveness of penicillin have included such measures as:

1. Varying and multiple routes of administration.
2. Slowing absorption.
3. Blocking tubular excretion.
4. Employing selective inhibitory effects to alter tubular enzymatic mechanisms (caronamide).
5. Combining methods.
6. Reactivating insoluble penicillin salts *in vivo*.

Because of the illness of Dr. Erling Platou, his inaugural thesis was read by Dr. Edwin Robb.

TABLE I. PENICILLIN—AVERAGE CONCENTRATION AND DURATION OF EFFECTS
10,000—25,000 U. given to infants and children

Route	Stat.	½ hr.	1 hr.	2 hr.	3 hr.	Absorption Variation
I.V.	2.5	.15	.1	.03	trace	0
I.M.	0	.5	.3	.2	.1	0
Sub-Q	0	.3	.3	.2	.1	0
Oral	0	.5	.2	.08	.03	+
Suppression of Renal Clearance—2 to 5 fold increase						+

Modified from Kolmer, Cooke, Goldring, and Husson. Dosage, body weight, fluid intake, renal function, and method may alter levels

7. Using an alternate antibiotic with slow absorption curve.
8. Varying frequency and size of dosage.

Varying and Multiple Routes of Administration

For the great majority of penicillin-susceptible infections, periodic levels of penicillin from 0.01 to 0.1 units per c.c. of plasma twice daily are adequate. To attain such levels, intramuscular injections of aqueous penicillin in doses of 10,000 to 25,000 units, or oral doses of 50,000 to 100,000 units, have been used successfully in infants and children.

In infections of the respiratory tract, inhalation in aerosol has been useful, particularly as an adjuvant to intramuscular administration; surprisingly high levels have sometimes been attained after inhalation alone. Bryson and Grace,[1] and Prigal[10] have reported that penicillin given in doses of 100,000 to 200,000 units suspended in aerosols of propylene glycol-glycerine, or in zephiran-glycerine alone, produces apparently adequate blood levels for as long as five hours. This mode of therapy has proved beneficial in purulent sinusitis, as well as in fibrocystic disease, intrinsic infectious asthma, bronchiectasis and other diffuse bronchial or bronchiolitic diseases. Although a suitable nebulizer, a source of oxygen and a rubber tube are adequate equipment for older children, in infants and younger children an apparatus such as that described by Prigal[10] is perhaps superior.

The method of penicillin therapy described by Bryson and Grace[1] for respiratory infections combines penicillin intramuscularly in wax and oil every twenty-four hours (300,000 units), neosynephrine by nebulizer, penicillin 100,000 units in 3 c.c. of zephiran (1:1,000 aqueous as a detergent) for inhalation every eight hours, and deep breathing to accomplish the topical principle.

Local penicillin injected into pleural, pericardial, peritoneal, and synovial cavities enhanced effects of routine administration. Similarly, in meningitis, small well-diluted intrathecal doses of 5,000 to 10,000 units have been helpful, though larger ones have sometimes been followed by immediate or late irritative and degenerative effects on the nervous system.

In thrombophlebotic lesions, i.e., osteomyelitis, sinus thrombophlebitis, subacute bacterial endocarditis, et cetera, apparent enhancement of penicillin effects has followed concomitant use of anticoagulants. Since the minute lesion of meningitis has been shown to be throm-

bophlebotic, the question has been raised whether anticoagulants might be considered even for this disease.

When oral penicillin was first used, variations of concentration occurred in different patients and even in the same patient from hour to hour; fluid and food ingestion were shown to influence this. It was believed that penicillin was ineffective when taken by mouth because of destruction in the stomach, irregularities in absorption, and inactivation by residual food. Experiments conducted by Finland, McDermott, Libby, Cutting and Hoffman and Volini have resulted in several interesting conclusions:

1. The oral dose of penicillin must be about five times the intramuscular dose to produce comparable blood levels for three hour periods.
2. Addition of binding or buffering substances does not increase therapeutic levels significantly.
3. Saline solutions of penicillin were more easily passed out of the stomach by spurts, causing more rapid and complete total absorption.
4. The effects of food were best minimized by giving penicillin one hour before meals, after a three- or four-hour fast.

The work of Hoffman and Volini[5] has shown that in older children and adults penicillin levels are best maintained orally by an initial dose of 200,000 units in saline followed in one hour by 100,000 units and then 100,000 units every three hours. By this plan, blood levels well above 0.03 units per cubic centimeter were maintained, although individual variations occurred. Doses of 25,000 have been reported by Husson[6] as producing adequate levels in infants.

Slowing of Absorption

Several methods of slowing absorption have been tried, including such simple physical changes as cooling the site of injection. The most effective methods developed thus far have employed suspensions in beeswax and peanut oil (Romansky formula) or in procaine and sesame oil.

The first major attempts to prolong activity of penicillin by the addition of a binding substance were made in 1943 and 1944. Beeswax was found to be best for this purpose, although it produced rather frequent tissue reactions. By using a small concentration of beeswax in peanut oil, however, it was possible to avoid most of these. Concentrations of 4 to 4.8 per cent beeswax in peanut oil were thought to produce a minimum of local inflammatory processes, and subcutaneous injection was found to be less painful than intramuscular. 100,000 units of penicillin in 1 c.c. of this mixture prolonged effective therapeutic levels of penicillin for six to eight hours after injection; 200,000 units increased absorption time slightly but 300,000 units in 1 c.c. of 4.8 per cent beeswax in peanut oil (given intramuscularly) prolonged blood levels for twenty-four hours. Less than 300,000 units per injection was considered inadequate and more than 300,000 units merely prolonged the initial peak blood level but did not give sustained concentrations of much greater magnitude.

Recent work by Dowling and Romansky[3] indicates that the greater the particle size of penicillin in an injectable mixture, the greater its effect in delaying absorption. They found that in order for a mixture to prolong absorption for twenty-four hours, at least 50 per cent of the particles in the mixture should have diameters of 50 microns or more. Because amorphous penicillin does not achieve this as well as crystalline penicillin, these investigators believe that crystalline calcium penicillin, when given intramuscularly in 2 per cent beeswax in peanut oil, produces more constant absorption and more effective blood levels than any other mixture we have at the present time.

A good body of evidence has accumulated to indicate that procaine penicillin, as proposed by Sullivan and his associates, will have an equally useful place. After injections of 1 c.c. containing 300,000 units, blood levels are usually still maintained in the therapeutic range after twenty-four hours. Up to the present time, undesirable side effects related to procaine or the menstruum of sesame oil have been conspicuous by their rarity. It is hoped that this mixture will prove to be as effective and more practical than the better-known oil-beeswax preparations.

Loewe and his associates have described a water-soluble preparation of penicillin containing gelatin-dextrose, ephedrine, and epinephrine which they claim will maintain measurable levels for twenty-four hours or longer and retain stability at room temperature for more than a year.

Blocking Tubular Excretion

About 80 per cent of penicillin is excreted by normal renal tubules and found in urine. Thus, any drug which could effectively yet harmlessly block tubules might conceivably raise plasma concentrations. Diodrast or iodypyrin (used in urography) and para-amino-hippuric acid (used in functional tests of the tubules) have been successfully administered for this purpose. Penicillin excretion can be suppressed almost completely by continuous intravenous infusion of either of these drugs, and high levels of penicillin can be obtained, though such large quantities of the inhibitors are often required that the method has been found somewhat impractical. Despite this handicap, it has accounted for some striking therapeutic results in resistant infections. Benzoic acid and sodium benzoate have also apparently enhanced plasma concentrations.

Employing Selective Inhibitory Effects on Tubular Enzymatic Mechanisms

Beyer et al introduced caronamide, believed to be wholly excreted by glomerular filtration. It probably has a selective inhibitory effect on the enzymatic mechanism of the tubules, so it suppresses tubular excretion in a manner different from the mass competition or "blocking" with diodrast or para-amino-hippuric acid.

Strauss et al[12] studied the effectiveness of caronamide and sodium benzoate individually and in combination. Sodium benzoate has been shown to have an anti-penicillinase effect which, some contend, may explain its properties more accurately than its blocking effect. Its lower

toxicity and cost might make it more desirable. The dose employed has been 1.2 gm. per 100,000 units. Caronamide is supplied in 0.5 gm. tablets and is given in doses of 0.4 gm. per kilo per day. Since it is excreted in four hours, the dose-interval should be three hours.

oral penicillin. Eighty per cent of the patients had assayable levels at twenty-four hours, after 300,000 units of intramuscular penicillin alone, the average concentration being 0.058 units per 1 c.c. at this time. Intramuscular injection of 300,000 units followed by 100,000

TABLE II. EFFECT OF CARONAMIDE AND SODIUM BENZOATE ON PLASMA PENICILLIN CONCENTRATION AFTER INTRAMUSCULAR AND ORAL PENICILLIN THERAPY

300,000 units in oil followed by 50,000 units by mouth at 12, 15, 18, and 21 hours

Subject	Sex	Age	Drug	Plasma Penicillin Concentration				
				15 hrs.	18 hrs.	24 hrs.	26 hrs.	28 hrs.
D	F	3 mo.	P only	0.51	1.02	0.13	.06	.06
C	M	3 mo.	P+C+B	4.10	1.024	0.256	.06	.06
D	M	3 mo.	P+C+B	1.024	...	0.51	...	.06
H	F	4 yr.	P+C+B	.03	.03	0.06	.03	.03
N	M	4 yr.	P+C+B	.03	.03	.256	.03	.03

Some of the observations of Strauss on caronamide and sodium benzoate were to the effect that caronamide or sodium benzoate given orally enhanced the plasma penicillin concentration following either oral or intramuscular administration of penicillin. Oral penicillin in combination with both caronamide and sodium benzoate resulted in greater enhancement of the plasma penicillin concentration than was found with either of the two drugs alone. The trio was more effective than either of the pairs. Both caronamide and sodium benzoate were, however, shown to have a serious limitation. Under certain conditions they apparently accentuate the variable absorption already observed after oral administration of penicillin.

Crosson et al[2] reported that caronamide given orally "elevates" the plasma concentration of penicillin two to seven times following its oral and parenteral administration. They concluded that both oral and intramuscular administration of penicillin is greatly enhanced by the oral use of caronamide.

Seeler, Wilcox, and Finland[11] made similar observations in older subjects but noted that approximately twice the dose of caronamide was necessary to produce equivalent levels in persons of younger age groups.

Rapaport and his associates reported no toxicity due to caronamide in fifteen children. Penicillin levels were markedly elevated with doses of 0.4 gm. per kilo per day given in divided doses at three-hour intervals. Eagle contends, "To maintain an effective concentration of such blocking agents may prove no less laborious and with some of these agents no less costly than to repeat the injections of pencillin or to increase the dosage."

Combining Methods

Combined methods of penicillin administration and clearance suppression have been extensively studied. Trussel, Sinclair, and Buchanan[13] recently reported observations made after patients had received intramuscular injections of penicillin in 2 per cent beeswax in peanut oil. These were compared with levels obtained from others who received similar injections complemented by

units orally at twelve, fifteen, eighteen, and twenty-one hours yielded assayable levels in all subjects at the end of twenty-four hours, the average level at this time being 0.139 units per c.c.

Suppressed renal clearance has been most effectively accomplished to date by a combination of sodium benzoate and caronamide. Combining this suppression of renal clearance demonstrated by Strauss with the delayed absorption technique of Trussel and associates, we have attempted to raise and prolong levels in infants.

Table II reveals a tendency toward higher and more prolonged levels in infants who received penicillin in oil and beeswax and oral penicillin together with caronamide and sodium benzoate. A high "peak" is demonstrated but the number of observations is still small. Study is now in progress to determine whether this planned combination may have sufficient merit to justify its use in overwhelming infections.

Reactivating Insoluble Penicillin Salts in Vivo

After injections of silver, mercuric, and ferric penicillinates into rabbits, Monash[9] was recently able to show that these inactive and insoluble penicillins can be reactivated *in vivo*. One injection of 20,000 units of silver or mercury penicillinate produced blood levels of 0.08 units per c.c. at seventeen hours; one of ferric penicillinate, a level of .16 units per c.c. at seventeen hours. Similar blood levels were also recorded after the use of organic substances such as brilliant green penicillinate.

Using An Alternate Antibiotic with a Slow Absorption Curve

Eagle and his associates[4] have studied bacitracin. This substance, discovered by Johnson, Anker, and Meleny[8] in culture filtrates of B. subtilis, possesses bactericidal properties and has a low renal clearance. Although samples studied to date are gravimetrically only one-twelfth as active as penicillin G *in vitro*, in this respect its slower excretion and resulting higher blood level raises the hope that similar preparations may eventually be forthcoming.

(Continued on Page 1140)

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(Continued from Page 1138)

Varying the Frequency and Size of Dosage

Following development of biologic tests to determine plasma concentration of penicillin accurately, and later general acceptance of a therapeutic threshold of 0.03 units per cubic centimeter, there has developed a tendency towards attempting to maintain concentrations at or above this therapeutic minimum without consideration for duration of bacteriostatic effects.

It has recently been observed that "periodic peaks" of penicillin are probably adequate alone for many, if not most, Gram-positive infections. Experiments of Jawitz[7] appear to show that the effects of penicillin on streptococcal infections in the mouse last much longer than measurable blood concentrations. Assayable levels persisted for only one hour after injection of the drug, while depression of bacterial population continued for eight hours or longer. Zubrod[14] investigated the relative efficacy of different dosage schedules of penicillin in beta hemolytic streptococcal infection of mice. He found that in treatment with multiple doses of aqueous penicillin, survival depends more on total dose administered than on the number of fractions into which the total dose is divided. Marshall states that the maintenance of a constant blood concentration is probably unnecessary for efficient therapy in the human. He believes that it should be possible to accomplish satisfactory therapy with aqueous penicillin given in even one, two or three injections per day. After all, bacteriostasis is but a part of the recovery mechanism. Recently, large doses of aqueous penicillin given every twelve hours have been reported by several clinics to be very effective.

Levels so obtained may not be adequate to combat all bacterial infections. Sustained very high concentrations of penicillin (possibly augmented by "peak" doses) appear to be the best available direct method for attacking severe infections. Strain resistance to penicillin *in vivo* has rarely been observed as an acquired characteristic even following exposure to subcurative doses of antibiotics. Penicillin resistance usually develops slowly and is not a frequent clinical problem. Mixed infection more commonly explains what may seem like strain resistance. The need for unusual enhancement of effects is therefore not common. When naturally resistant mutants are suspected, solution of resultant problems should be sought in clinical judgment and biologic tests for strain susceptibility. The dosage and method of administration of penicillin should be planned in such a manner as to eliminate both susceptible and naturally resistant variants as rapidly and as completely as possible.

Summary and Conclusions

1. Adjuvant or multiple routes of administration of penicillin result in additive effects.

2. Slowing absorption by injecting suspensions of large crystalline particles of penicillin in beeswax and peanut oil, or in procaine and sesame oil, offer methods for maintaining increased levels.

3. Blocking of tubular excretion with diodrast or para-amino-hippuric acid enhances penicillin levels but is still impractical.

4. Suppression of renal clearance with sodium benzoate and caronamide will elevate plasma levels of penicillin in most instances.

5. Combined methods for slowing absorption and suppressing renal clearance are still in the experimental stage.

6. The reactivation of insoluble penicillin salts may prove to be useful, and more effective antibiotic agents having lower renal clearances may yet be developed.

7. Aqueous solutions of injectible or oral penicillin in large infrequent doses are probably adequate for most infections due to susceptible organisms.

References

1. Bryson, V., and Grace, E.: Aerosols. New England J. Med., 237:683-692, 1947.
2. Crosson, J. W.; Boyer, W. P.; Shaw, C. C., and Miller, A. K.: Caronamide for increasing penicillin concentrations in man. J.A.M.A., 134:1528, (Aug. 30) 1947.
3. Dowling, H. F.; Romansky, M. J., et al.: Penicillin in oil and beeswax, J.A.M.A., 135:567-568, 1947.
4. Eagle, H., and Newman, E.: Renal clearance of penicillin F.G.K.X. J. Clin. Invest., 26:903, (Sept.) 1947.
5. Hoffman, W. S., and Volini, A.: Administration of oral penicillin. Am. J. M. Sc., 213:513-534, 1947.
6. Husson, Geo. S.: Oral penicillin in infants, J. Pediat., 31:651, (Dec.) 1947.
7. Jawitz, Ernest: Dynamics of the action of penicillin in experimental animals. Arch. Int. Med., 77:1, 1946.
8. Johnson, B., Anker, H., and Meleney, F.: Bacitracin. A new antibiotic, Science, 102:376, 1945.
9. Monash, S.: Use of insoluble penicillin salts for prolongation of penicillin blood levels. Science, 106:370, (Oct. 17) 1947.
10. Prigal, S. J., et al: Aerosol penicillin. J.A.M.A., 134:932-937, 1947.
11. Seeler, A. O.: Wilcox, Claire, and Finland, Maxwell: Enhancement of blood levels by caronamide during intramuscular administration of penicillin. J. Lab. & Clin. Med., 32:807, (July) 1947.
12. Strauss, E.; Richbury, P. L.; Saba, P. X., and Alexander, J. E.: Enhancement of plasma penicillin concentration by caronamide and sodium benzoate. J. Clin. & Lab. Med., 32:7; 818, (July) 1947.
13. Trussel, W. S.; Sinclair, A. B., and Buchanan, S. C.: Duration of effective blood levels following administration of penicillin. Canad. M.A.J., 57:387, (Oct.) 1947.
14. Zubrod, Charles G.: Comparative efficiency of single and multiple dosage regimens of the penicillins. Bull. Johns Hopkins Hosp., 81:400, 1947.

The meeting was adjourned.

A. E. CARDLE, M.D., *Secretary*

ARE YOUNG SPECIALISTS DENIED A CHANCE?

(Continued from Page 1120)

of investigation and lead automatically to full membership after a year. Also, letters were sent by the Society's secretary to all the local hospitals urging that returned servicemen be accommodated to the fullest extent. Other localities might well follow this example.

If there are localities in which established doctors are throttling competition by preventing hospital appointments for beginners, the hospital staffs constitute the agency for correcting the situation. Local societies might well review their attitudes toward strangers locating in their communities, with a view to revising provisions of constitutions where indicated.

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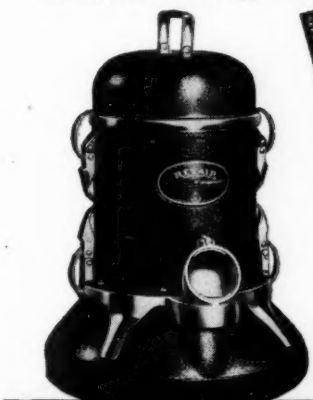

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Reports and Announcements

INTERSTATE POSTGRADUATE MEDICAL ASSOCIATION OF NORTH AMERICA

The International Medical Assembly of the Interstate Postgraduate Medical Association will be held November 9 to 12, 1948, at the Public Auditorium in Cleveland, Ohio.

The program this year, as in former years, will consist of diagnostic clinics and addresses at the morning, afternoon and evening sessions by outstanding educators and clinicians from this and foreign countries. Extensive commercial exhibits will be on display.

The registration fee for the four-day session is $5.00. Doctors in uniform, interns, nurses, dietitians and technicians will be admitted upon the payment of $1.00.

The officers of the Association this year are: Dr. Herman L. Kretschmer, Chicago, president; Dr. Evarts A. Graham, St. Louis, president-elect; Dr. John F. Erdmann, New York, and Dr. Frank H. Lahey, Boston, presidents of clinics.

Hotel reservations should be made through the Housing Bureau for Interstate Postgraduate Medical Assembly, 511 Terminal Tower, Cleveland 13, Ohio.

AMERICAN COLLEGE OF SURGEONS

The thirty-fourth clinical congress of the American College of Surgeons will be held from October 18 to 22, 1948, in Los Angeles, with headquarters at the Biltmore Hotel. Surgeons from thirty-two states, two Canadian provinces and one from Sweden, Dr. Crafoord of Stockholm, will participate in the program. The research work of some 250 surgeons and their assistants will be reported at the eight sessions of the Forum on Fundamental Surgical Problems.

Twenty-four hospitals in Los Angeles and vicinity will hold operative and nonoperative clinics, and telecasts of operations from the Los Angeles County Hospital will be shown each day at the Biltmore Hotel.

Dr. Dallas B. Phemister of Chicago will be inaugurated as president of the college to succeed Dr. Arthur Wallen of Boston. Dr. Howard A. Patterson of New York will be elected first vice president, Dr. Carl H. McCaskey of Indianapolis, second vice president, and Dr. Paul B. Magnuson of Washington continues as secretary.

NORTHERN MINNESOTA ASSOCIATION

The twenty-eighth annual meeting of the Northern Minnesota Medical Association was held in Duluth on August 20 and 21.

Among subjects discussed in papers presented at the two-day meeting were surgery of the colon, electrocardiograms, abnormal pregnancy, treatment of burns, infant diseases, and general medical diagnosis. Speakers included Dr. Wilford J. Deweese, Bemidji; Dr. Arthur C. Kerkhof and Dr. Tague C. Chisholm, Minneapolis; Dr. B. Marden Black and Dr. Walter C. Alvarez, Rochester; Dr. N. Logan Levin, Saint Paul, and Dr. Earl E. Barrett, Duluth.

A clinical-roentgen-pathological conference, arranged by Dr. E. L. Tuohy and Dr. Henry G. Moehring, Duluth, was a feature of the second day of the meeting.

Principal speaker at the annual banquet, held in Hotel Duluth on August 20, was Senator Joseph H. Ball, who attacked the proposed Wagner-Murray-Dingell bill, declaring that it would result in "medical dictatorship" by the government. Other speakers at the banquet were Dr. A. E. Cardle, Minneapolis, and Dr. E. M. Hammes, Saint Paul, president and president-elect, respectively, of the Minnesota State Medical Association.

At a business session, the association members elected Dr. R. H. Puumala, Cloquet, president of the group to succeed Dr. Charles W. Vanderslius, Bemidji. Other offices named were Dr. Wilford J. Deweese, Bemidji, vice president, and Dr. C. L. Oppegaard, Crookston, secretary-treasurer. Alexandria was selected as the meeting place for the 1949 convention.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

Two scientific papers were presented at a meeting of the Minnesota Society of Neurology and Psychiatry held at the Minnesota Club in Saint Paul on September 14.

Dr. Ernest M. Hammes, Jr., presented an inaugural thesis on "Familial Periodic Paralysis," and Dr. Marvin Sukov gave as his inaugural thesis a paper on "Observations on Teaching Psychotherapy."

A NEW REHABILITATION CENTER

A new therapeutic center, the St. Paul Rehabilitation Center, has been established at 279 Rice Street, St. Paul. Physical therapy, occupational therapy, and speech therapy are given in unified service by qualified therapists.

Conditions treated include industrial injuries, infantile paralysis, fractures, cerebral palsy, arthritis, neuritis, amputees, paraplegias, skin disorders, congenital defects, contractures resulting from burns, and postural and structural defects of muscles, bones, and joints. Speech disabilities treated include delayed speech, sound substitutions, speech of the hard of hearing, cleft palate speech, cerebral palsy speech, aphasic speech, voice disorders, and stuttering. Throughout the Center new modern therapeutic equipment has been installed.

The aims of the Center are prevention of unnecessary handicaps, hastening of rehabilitation, restoration of function if possible, utilization of residual function, and adjustment of patient to any residual disability. All admissions are made upon the referral of medical doctors.

The medical policies of the Center are guided by a Medical Advisory Board which consists of seven doctors appointed by the Ramsey County Medical Society.

An Executive Committee formulates policies. This committee is composed of representatives from the initiating agency, the Family Nursing Service, and the three sponsoring agencies, the Minnesota Society for Crippled Children and Adults, Inc., Junior League of St. Paul, Inc., and the Wilder Charity.

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In Memoriam

ROBERT EARL

Dr. Robert Earl, a practicing physician in Saint Paul for more than fifty years, died August 11, 1948.

Robert Earl was born in Lansing, Iowa, on August 27, 1872. He moved to Minneapolis at ten years of age. He graduated from the University of Minnesota Medical School in 1896 and interned at Bethesda Hospital, Saint Paul, where he began a fruitful period of surgical training under Dr. Edouard Boeckmann and Dr. E. M. Lundholm. He received a diploma from the New York Post Graduate School and in 1911 spent a year of study in Europe, especially in the field of brain surgery. As a result, he was one of the first surgeons in this region to interest himself in the field of neurosurgery. This was essential to the development of a neurological and psychiatric center at Mounds Park Sanitarium in collaboration with such early neurologists as Dr. Eugene Riggs and Dr. Charles Ball.

Dr. Earl was instrumental in having the Gillette State Hospital located in Saint Paul and for years was very active on the surgical staff. In 1910 Dr. George Earl became associated with Dr. Robert Earl in the practice of medicine, from which association the Earl Clinic developed.

Dr. Earl was a Diplomate of the American Board of Surgery, a Fellow of the American College of Surgeons, a member of the Western Surgical Association, the American Medical Association, Minnesota State Medical Association, Minnesota Academy of Medicine, the Saint Paul Surgical Society and the Ramsey County Medical Society, of which he was president in 1918. He recently became a member of the Fifty Club of the Minnesota State Medical Association.

Dr. Earl is survived by his wife; a daughter, Mrs. James Slocum of Minneapolis; a son, Dr. John Earl of Saint Paul; five grandchildren; two sisters, Emily Earl and Mrs. Hilda Anderson of California, and a brother, Dr. George Earl of Saint Paul.

LEONARD EASTON CLAYDON

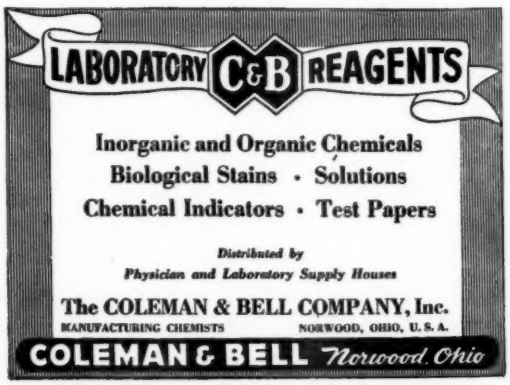
Dr. L. E. Claydon, a physician and surgeon of Red Wing, Minnesota, since 1902 and well known as a musician and traveler, died at his home August 15, 1948. He was seventy-nine years of age.

Dr. Claydon was born in Redditch, England, April 5, 1869, and came with his parents to Perham, Minnesota, in 1879. He graduated from the University of Minnesota School of Pharmacy in 1885, and for three years was pharmacist at the Northern Pacific Beneficial Association Hospital at Brainerd. Studying medicine at the University of Minnesota Medical School, he graduated in 1895. He practiced at Mazeppa, Minnesota, from 1895 until 1902, when he moved to Red Wing. Associated at one time with Doctors Cremer and Johnson, he later formed the Claydon Clinic with his son, Dr. Donald R. Claydon. Upon the latter's death in 1941, another son, Dr. Howard Claydon, became associated with him in practice.

Dr. Claydon was a member of Christ Episcopal Church, the Red Men's Club, the Elks Club, Masonic Lodge, Order of the Eastern Star, Odd Fellows, Workman Lodge and the AOUW. He was also a member of the Goodhue County Medical Society, the Minnesota State Medical Association, the American Medical Association and the Southern Minnesota Medical Association.

Dr. Claydon was fond of traveling and made his first trip abroad in 1900. In 1909 he went to Sweden; in 1914 to the Holy Land; in 1922 to South America; in 1924 to England and France; in 1926 to Panama; in 1928 to Europe; in 1930 to Russia, and in 1937 to South America. In addition, he circled the globe three times. His daughter, Marjorie, who accompanied him on his trip around the world in 1920, wrote a book on their experiences entitled "Around the World with Dad."

Dr. Claydon is survived by his wife, a son, Dr. Howard Claydon, a brother, P. H. Claydon, and a sister, Mrs. Carl Bull, of Wolf Point, Montana. His daughter, Marjorie, and son, Dr. Donald R. Claydon, preceded him in death.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Of General Interest

Dr. Clyde E. Wilson, Blue Earth, was elected president of the Blue Earth school board at a meeting held during the summer.

* * *

Dr. J. R. Hodgson, Rochester, spoke on "Roentgenologic Diagnosis of Lesions of the Gastrointestinal Tract" at a meeting of the Third District Medical Society in Estelline, South Dakota, on August 12.

* * *

Dr. Winchell McK. Craig, Rochester, was elected president of the Harvey Cushing Society, named after the pioneer in neurosurgery, at a meeting held in San Francisco in August.

* * *

Dr. and Mrs. A. W. Adson, Rochester, journeyed to Honolulu, Hawaii, early in September, where Dr. Adson spoke before delegates to the Pan Pacific Surgeons Conference.

* * *

The partnership of Dr. A. J. Emond and Dr. J. S. Emond, Farmington, was announced dissolved on August 20. The brothers are continuing individual practice in their offices in the Emond Hospital building.

* * *

Dr. A. W. Nuetzman, Faribault, attended a dinner meeting of designated medical examiners of the Civil Aeronautics Administration in Minneapolis on September 3.

* * *

A former Winona resident, Dr. Richard J. Wagner began a fellowship in surgery at the University of Minnesota Hospitals during the middle of August. He completed his internship at Swedish Hospital in Minneapolis in June.

* * *

More than 150 persons attended a homecoming reception in honor of Dr. Magnus C. Peterson, superintendent of the Rochester State Hospital, in the state hospital auditorium on August 17. Dr. Peterson had recently returned from a two-month tour of Europe.

* * *

Dr. John J. McLeod, Jr., formerly of Birchwood, Wisconsin, began practice on August 3 at the clinic of Dr. James A. Cosgriff in Olivia. A graduate of the Marquette University School of Medicine, Dr. McLeod served his internship at St. Mary's Hospital, Duluth.

* * *

On September 9, Dr. Vernon L. Hart, Minneapolis, left New York to travel to the American Occupied Zone of Germany to spend six weeks taking part in a teaching program in various American hospitals. During the teaching program, Dr. Hart served as a civilian consultant for the office of the Surgeon General.

* * *

Formerly of Le Centre, Dr. Leonard Prochaska became associated in practice with Dr. A. A. Brink of Baudette in August. Dr. Prochaska, a graduate of the Marquette University School of Medicine, has studied at Minneapolis General Hospital.

* * *

A former native of Zumbrota, Dr. Robert J. Anderson became medical director and chief of the tuberculosis control section of the U. S. Public Health Service on September 1. Dr. Anderson, living in Washington, D. C., had been assistant chief of the section since 1946.

* * *

Though plans had not been definitely made, it was announced on August 12 that Hills would soon have a resident physician, the first since 1940. A Dr. Barr of Sioux Falls had indicated that he would like to conduct a medical practice in the city.

* * *

Superintendent of the Mineral Springs Sanitarium, Dr. Karl H. Pfuetze spoke at a meeting of the Rotary Club in Stillwater on September 2. Dr. Pfuetze discussed some of the phases of operation of the institution he heads.

* * *

West-Central Minnesota Health Day was held in Willmar on September 9. Among physicians appearing on the program were Dr. B. O. Mork, Jr., Worthington; Dr. W. W. Yaeger, Marshall; Dr. Robert Barr, Minneapolis, and Dr. B. J. Branton and Dr. Lloyd Gilman, both of Willmar.

* * *

At the meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons, held early in September at Hot Springs, Virginia, Dr. R. D. Mussey, Rochester, presented the presidential address, and Dr. L. M. Randall, Rochester, spoke on the subject, "Elderly Primigravid Women."

* * *

Two Rochester physicians presented papers at a meeting of the Boone-Story County Medical Society at Ames, Iowa, early in September, Dr. D. O. Ferris spoke on "Traumatic Injuries of the Genito-urinary Tract," while Dr. H. M. Odel's subject was "Objectives in the Management of Acute Renal Failure."

* * *

Near the end of August, Dr. John Smyth, after half a year as an associate in practice with Dr. F. H. Baum-

(Continued on Page 1148)

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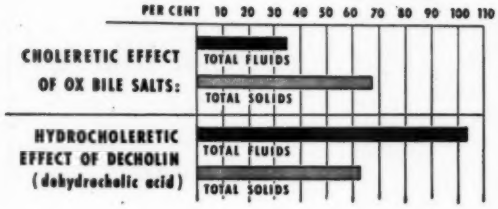
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ELKHART, INDIANA

(Continued from Page 1146)

gartner in Albany, announced that he intended to move soon to Lester Prairie to open his own practice. Before he began his practice in Albany with Dr. Baumgartner, Dr. Smyth served a tour of duty in the navy.

* * *

While attending a meeting of the American Association of Blood Banks in Buffalo, New York, late in August, Dr. T. H. Seldon, Rochester, presented a paper entitled "Ways and Means of Obtaining Sufficient Donors." During a business session of the meeting, Dr. Seldon was elected vice president of the group.

* * *

Dr. A. C. Anderson, formerly of Winsted, has taken over the practice of Dr. R. E. Erickson in Hector. A graduate of the University of Minnesota, Dr. Anderson practiced for the past two years in Winsted after spending two years in the army. He began his duties in Hector on August 30.

* * *

The Northfield clinic, conducted by Dr. R. F. Mears and Dr. Joseph C. Belshe, in August, opened branch offices in Randolph. It was announced that remodeling of the front of the main office in Northfield was scheduled for early this fall. Recently the interior of the building was completely redecorated and remodeled.

* * *

As guest speaker at the Midsummer Radiological Conference of the Rocky Mountain Radiological Society, held in Salt Lake City during August, Dr. J. D. Camp of Rochester presented two papers entitled "Sources of Error in Encephalography and Ventriculography" and "Significant Roentgenologic Findings in Intracranial Disease."

* * *

A former Benson resident, Dr. Cassius J. Van Slyke was named director of the National Heart Institute early in August. A graduate of the University of Minnesota Medical School in 1927, Dr. Van Slyke has been associated with the U. S. Public Health Service since 1932. He has directed the research grants-in-aid and the fellowship program of the National Institute of Health since 1945.

* * *

Dr. Dale Furnell, formerly of Saint Paul, has become associated in practice with Dr. W. J. Lund at the Northern Pacific Clinic in Staples. A graduate of the University of Minnesota Medical School in 1945, Dr. Furnell has studied at Ancker and Abbott Hospitals and has served as a resident physician at the Northern Pacific Hospital in Saint Paul.

* * *

Plans were made in August to hold a Health Day in Mankato on October 13. The program for the event listed round-table discussions, health movies, talks on community health problems, and addresses on numerous health topics by physicians, public health nurses, school

representatives and mental hygiene experts. An address by Governor Luther Youngdahl was scheduled for the evening program.

* * *

Soloist at a Pop concert in Saint Paul on August 25 was Dr. Charles Peluso, Minneapolis, making his first solo appearance at the concerts since 1945 when he was presented on a program while on leave from the navy. A graduate of the University of Minnesota Medical School, Dr. Peluso served his internship at St. Luke's Hospital in Duluth.

* * *

Dr. Harold R. Mundall has opened an office at 1812 Selby Avenue, Saint Paul, for the practice of medicine. Dr. Mundall graduated from Marquette University Medical School in 1945 and served in the Army three years, being stationed at the tuberculosis hospital at Waukesha, Wisconsin, and at the Veterans' Hospital at St. Cloud before his discharge June 3, 1948. He was commissioned as a captain.

* * *

On August 16, Dr. Frederich G. Gunlaugson, a former staff member of the Fergus Falls State Hospital, joined the staff of the Minneapolis Health Department as director of communicable disease control, filling a post that had been empty for almost a year. Dr. Gunlaugson is a graduate of the University of Minnesota and Johns Hopkins University. He has practiced medicine in Moorhead.

* * *

It was announced on August 5 that Dr. Harry L. Berge, of Isle, had become a part-time assistant of Dr. W. F. Nordman in Mora. A graduate of the University of Minnesota Medical School, Dr. Berge studied surgery for two years at Minneapolis General Hospital. He has served as chief of surgery at Mason General Hospital, Long Island, New York, and as acting chief of surgery at Camp Lee, Virginia.

* * *

The marriage of Dr. Harry J. Anderson, formerly a resident of North Branch, and Miss Darlene Mortenson, formerly of Benson, took place on August 21 in the chapel at Fort Snelling. Dr. Anderson, a graduate of the University of Minnesota Medical School, is a resident physician in the Department of Psychiatry and Neurology at the University Hospitals and Veterans Hospital, Minneapolis.

* * *

Dr. and Mrs. Anderson Hilding, Duluth, left for Europe on August 27 to attend the 1948 conference of the Collegium Oto-Rhino-Laryngologicum Amicitiae Sacrum held September 1 to 5 in Copenhagen, Denmark. The collegium, an international research society, was resuming its annual meetings after a nine-year wartime suspension. Following the conference in Copenhagen, Dr. and Mrs. Hilding went on a trip through Sweden.

* * *

The Park Region Health Day was held in the high school auditorium at Fergus Falls on September 29.

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1. Kasper, J. A. and Jeffrey, I. A.: A Simplified Benedict Test for Glycosuria, Amer. J. Clin. Pathology, *14*:117-21 (Nov.) 1944.

2. Haid, W. H.: The Use of Screening Tests in the Clinical Laboratory, J. Amer. Med. Tech., *8*:606-14 (Sept.) 1947.

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Among other events, three panel discussions were held, covering the following topics: "Our Community Health Problems," "How Can We Prevent Behavior Problems in Children?" and "The School's Part in Your Child's Health." Included in those appearing in the discussions were Dr. Mario Fischer, Duluth, and Dr. Edward Anderson, Minneapolis.

* * *

Expansion of the public health nursing service in Nobles County was announced on July 22 by Dr. B. O. Mork, Jr., Worthington, medical director of Public Health Unit No. 5. It was stated that a second public health nurse, Anna Marie Christman, formerly of Glen Lake Sanatorium, would assume her duties in Nobles County on September 1, thus bringing the county a step closer to the ideal proportion of one nurse for each 5,000 persons in the population.

* * *

Dr. Albert Faulconer, Jr., Rochester, spoke on "The Treatment of Anoxic Encephalopathy" at a meeting of the Kansas City Society of Anesthesiologists in Kansas City, Missouri, on September 8. The following day he presented two papers before the Kansas Society of Anesthesiology and the Salina County Medical Society. Titles of the papers were "Choice of Anesthetic Agent and Method" and "Some Factors Influencing the Administration of Inhalation Anesthesia."

* * *

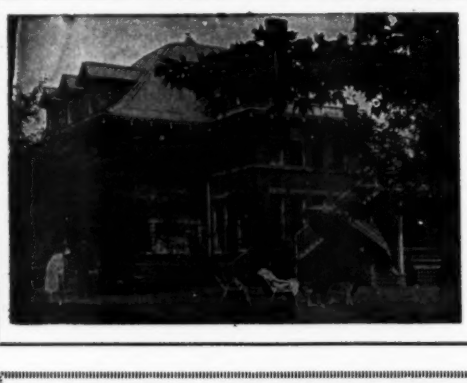
Lake County, with a record of no tuberculosis deaths in 1947, was given special recognition at a ceremony held at a Rotary Club meeting in Two Harbors on August 17. Accreditation certificates were presented by Dr. Mario Fischer, Duluth, acting director for Health District No. 4 of the Minnesota Health Department, and a Christmas Seal plaque for individual service was awarded by Dr. E. A. Meyerding, executive secretary of the Minnesota Public Health Association.

* * *

Early in August, Dr. Wallace Hill, formerly of South Bend, Indiana, arrived in Windom to become an assistant to Dr. L. J. Hoyer in the Hoyer Clinic. Dr. Hill, a graduate of McGill University Medical College in Montreal, Canada, recently completed two years of study in Memorial Hospital, South Bend. Previously he served in the navy for two years. While Dr. Hoyer and his family were on a two-week vacation in August, Dr. Hill conducted the Windom practice.

* * *

A hypodermic injection technique that takes "all the sting out of shots" was described this summer in a letter written to the *Saturday Evening Post* by a patient of Dr. Alma L. Wurdemann of White Bear Lake. The method, not unknown to many physicians, is useful in eliminating the fear that many people have of the hypodermic needle. The injection is preceded by a series of sharp slaps with the left hand on the selected site; then, between slaps, the needle is slipped in with the right hand. Often, then, the injected patient, if he hasn't been watching, looks up and asks, "When you going to shoot me, Doc?"



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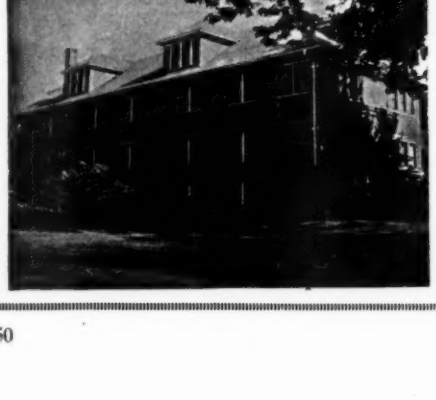

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Announcement has been made of the gift of $13,600,000 by the A. W. Mellon Educational and Charitable Trust to the University of Pittsburgh for a new graduate school of public health to be headed by Dr. Thomas Parran, former Surgeon General of the U. S. Public Health Service. The graduate school will emphasize occupational and industrial health and research in all phases of public health. The school will serve as a postgraduate school for the training of physicians in public health work and for conducting basic research.

* * *

"The Use of Gelatin Foam in Thoracoplasties" was a topic discussed by two Minnesota physicians at the thirty-fifth annual Mississippi Valley Conference on Tuberculosis, meeting with the Mississippi Valley Trudeau Society in St. Louis on September 26. Dr. G. A. Hedberg, superintendent of the Nopeming Sanatorium, and Dr. William D. Seybold, Rochester, described how "gelfoam" delays lung re-expansion in thoracoplasties, permitting rib restoration to take place more satisfactorily.

* * *

Dr. R. H. Monahan, Jr., of the International Falls Clinic, left the city of International Falls on August 20 to begin a three-year fellowship in ophthalmology at the University of Minnesota Hospitals. His practice at the clinic was taken over by Dr. F. H. Walter.

A native of International Falls, Dr. Monahan was graduated from the University of Minnesota Medical School in 1943. During the war he was in the army, serving part of the time as an eye specialist in Fitzsimons General Hospital in Denver, Colorado, and part time as an eye consultant with the army in northern Italy.

* * *

After forty-six years of practice in Red Wing and vicinity, Dr. A. E. Johnson, head of the Red Wing Clinic, retired from active medical practice on August 1. A graduate of Rush Medical College, Chicago, in 1902, Dr. Johnson has devoted his entire medical career to his practice in Red Wing. He has been associated with the Red Wing City Hospital for thirty-five years. Now, seventy-two years of age, Dr. Johnson has purchased a residence in Minneapolis and plans to make his future home there.

* * *

Dr. Oscar Daignault, Benson, who retired from active practice on May 1, was honored by the Benson Chamber of Commerce at a ceremony on August 16. In commemoration of his forty-eight years of service to Benson as physician and civic leader, Dr. Daignault was presented with a bronze plaque citing his achievements.

A graduate in 1898 of the Montreal Medical School, a part of the University of Laval, Dr. Daignault first practiced in Saint Paul, then in Dayton and Hancock. In 1900 he moved to Benson, where he has remained for the last forty-eight years.

* * *

As director of the Commission on Liver Disease of the Army Epidemiological Board, Dr. C. J. Watson, chairman of the Department of Medicine of the University of Minnesota Medical School, journeyed to Germany in September to survey the liver disease re-

search program of the army and to teach and lecture on recent developments in the field. He visited hospitals at Bayreuth, Munich, Mainz, Frankfurt, Nuremberg and Heidelberg. Before returning to Minneapolis late in September he spent several days in London visiting hospitals and laboratories.

* * *

A bronze plaque was recently awarded to W. D. Price, president of the Saint Paul Mercury Indemnity Company, by the National Safety Council for the motion picture film, "Diagnosis: Danger." The film illustrates the hazards in hospitals and stresses accident prevention. It was judged the best non-theatrical film in the occupational safety field during 1947. Don Hawkins, Assistant Secretary of the Saint Paul Company, wrote the script and supervised production of the sound picture. Free bookings may be secured by writing the Safety Engineering Department, Saint Paul Mercury Indemnity Company, 111 West Fifth Street, Saint Paul, Minnesota.

* * *

Angling for radioactive fish in Bikini lagoon, site of atomic bomb tests two years ago, was described early in September by Dr. Asher A. White, clinical assistant professor of medicine at the University of Minnesota. During the past summer Dr. White spent almost a month as medical advisor with a marine biology division conducting a survey of long-range atomic bomb effects. All types of the lagoon's plant and animal life were captured by the research group to be studied for signs of still-present radioactivity. During the war Dr. White was executive officer of the Oak Ridge, Tennessee, hospital and later medical officer in charge of health and welfare at the Hanford, Washington, plutonium plant.

* * *

In late August, Dr. H. B. Roholt left Waverly to begin medical practice in Fosston. Since his graduation from the University of Minnesota Medical School, Dr. Roholt had been associated in practice with his father, Dr. C. L. Roholt, in Waverly. At his new practice in Fosston he is in charge of a twenty-bed hospital, with his offices located in the hospital.

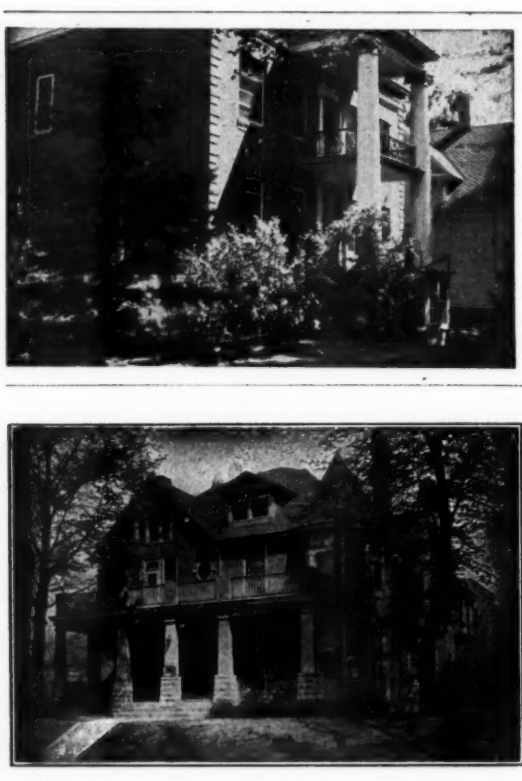
* * *

Forest Lake acquired a new physician on August 26 when Dr. R. A. Knudson, formerly of Chicago, arrived in the city to become associated in practice with Dr. J. A. Poirier. Dr. Knudson has been on the staff of a hospital in Louisville, Kentucky, and has studied at Cook County Hospital in Chicago. He served in the armed forces for two years.

* * *

Chief of staff at the Sister Elizabeth Kenny Institute in Minneapolis is Dr. E. J. Huenekens, former chairman of the Minneapolis emergency poliomyelitis committee during the 1946 epidemic, who was named to the position on August 18. He is a clinical professor of pediatrics at the University of Minnesota.

At the same time it was announced that Dr. Miland



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E. Knapp, clinical associate professor of physical medicine at the University of Minnesota, had been appointed chief of physical medicine in charge of treatment at the institute. It was also stated that Dr. John F. Pohl, former medical supervisor of the institute, would be consulting orthopedic surgeon for the organization. Dr. Pohl is a clinical assistant professor of orthopedic surgery at the University of Minnesota.

HOSPITAL NEWS

Physicians and nurses of the Blue Earth Community Hospital staff met for dinner at the Riverside Town and Country Club on August 20. During the evening program, medical motion pictures were presented, and Dr. George Drexler, Blue Earth, showed a motion picture he had taken while stationed on New Britain during the war.

* * *

The Northern Minnesota Hospital in International Falls was closed on July 24 after nearly forty years of use in the community. The hospital, which was opened in 1909, has been replaced by the new International Falls Memorial Hospital.

* * *

Formerly of St. Cloud, Dr. Stanley Peterson has become resident radiologist on the staff of the St. Olaf Hospital in Austin. He replaces Dr. J. P. Medelman, Saint Paul, who for several years spent one day per week at the hospital as x-ray consultant.

* * *

A committee from Clarkfield, including Dr. M. I. Hauge, met with members of the Minnesota Department of Health in Minneapolis on August 17 to present plans for the Clarkfield hospital project. The plans were accepted with a few alterations, and it was expected that bids for the project would soon be asked.

BLUE SHIELD NEWS

Number of applications received for Blue Shield to August 31, 1948, 80,000
Number of Blue Shield cases paid from August 1 to August 31, 1948, 361. Total for 1948, 1414
Amount paid on Blue Shield cases from August 1 to August 31, 1948, $13,002.63. Total for 1948, $52,577.47

For some months the Minnesota Blue Shield office has been making payments on cases once a week. The policy of making payments on a weekly basis was announced in the Blue Shield article published in the May issue of MINNESOTA MEDICINE. By making weekly payments we are able to give better service to the physician and to the subscriber, and it is also possible for the physician to show the Blue Shield allowance on his monthly statement.

During the last month the Blue Shield office has received an increasing number of claims on which prompt payment could not be made because of the fact that the attending physician's office had returned the forms either not fully completed or with insufficient information. As an example, the hospital discharge date is often omitted; this information is necessary to compute the length of stay in the hospital. Frequently there is no listing of the type of service rendered, particularly in surgical

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cases. The diagnosis is given; however, it is difficult to determine if the case is medical or surgical and if surgical what procedure was carried out.

When claims are received with insufficient or incomplete information it is necessary to contact the physician for this additional information. This definitely retards our payment on the case; it means the physician must again check his records and it requires further correspondence by the physician's office as well as the Blue Shield office.

Doctors, you have done very well in completing forms and in giving the necessary information and those of us who work with this information sincerely appreciate your co-operation. In order that Blue Shield allowances can be paid in the shortest possible time and with the least amount of effort please complete the forms so that no correspondence is necessary.

In the event you have some outstanding Blue Shield cases on which you have received Medical Service Report forms, please complete them at your earliest convenience and submit them to the Blue Shield office for payment. Also, if you have rendered a Blue Shield service to a Blue Shield subscriber or dependent and have not received a form from the Blue Shield office, notify the office by letter giving the patient's name, address, group and contract number so that an investigation can be made on that case.

As more and more citizens of Minnesota become Blue Shield subscribers—and more and more are every day—the administrative problems of Blue Shield will increase. Many of these problems will be eliminated if the physicians of Minnesota continue to back their prepaid medical care plan as they have been doing and also if they continue to co-operate in the future as well as they have in the past.

PHI DELTA EPSILON LECTURE

The second annual Phi Delta Epsilon medical lecture will be given at the University of Minnesota medical sciences amphitheater, at 8 P.M., November 3, 1948. The essayist is Franklin Hollander, Ph.D., head of the Gastroenterology Research Laboratory of Mount Sinai Hospital, New York City, on the subject "Studies in Gastric Secretion." The lecture is presented under the combined auspices of the University of Minnesota medical school, the Phi Delta Epsilon undergraduate fraternity and the Minnesota Phi Delta Epsilon graduate club.

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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

THE FOOT AND ANKLE; THEIR INJURIES, DISEASES, DEFORMITIES AND DISABILITIES. Philip Lewin, M.D., F.A.C.S., Associate Professor of Bone and Joint Surgery, and Acting Head of Department, Northwestern University Medical School; Professor of Orthopaedic Surgery, Post-Graduate Medical School of Cook County Hospital; Attending Orthopaedic Surgeon, Cook County Hospital; Senior Attending Orthopaedic Surgeon, Michael Reese Hospital; Consulting Orthopaedic Surgeon, Municipal Contagious Disease Hospital, Chicago; formerly Colonel, Medical Corps, AUS. 3rd ed. 847 pages. Illustrated. Philadelphia: Lea & Febiger, 1947. Price, $11.00.

The new edition of this exhaustive work has been revised to cover some of the experience gained in the recent war. In general, the same material is covered as in the preceding editions.

The work offers students and practitioners a comprehensive discussion of the lesions encountered in the lower extremities. The bibliography is extensive.

—S. W. SHIMONEK, M.D.

HANDBOOK OF OPHTHALMOLOGY. Everett L. Goar, A.B., M.D., F.A.C.S. Professor of Ophthalmology, Baylor University College of Medicine, Houston, Texas. 166 pages. Illus. Price $5.50, cloth. St. Louis: C. V. Mosby Co., 1948.

This volume is refreshing in its format, inasmuch as handbooks are usually small and the type likewise small. This book size is royal octavo and the type 11 point, and easy to read. There are 48 text illustrations and 7 color plates, all good.

The author occupies a high standing in this specialty of medicine and is best known to the members of the Academy of Ophthalmology and Otolaryngology for his proficiency in the teaching of Biomicroscopy.

He states in the preface that this treatise was first written as a series of lectures for the junior medical students and adds pertinently that the books then available contained too much material for them to grasp.

The subject matter is brought up to date, and the opinions expressed are authoritative.

The reviewer is impressed with the minimum of verbiage employed to include in such a thoroughgoing manner the basic knowledge of this wide subject.

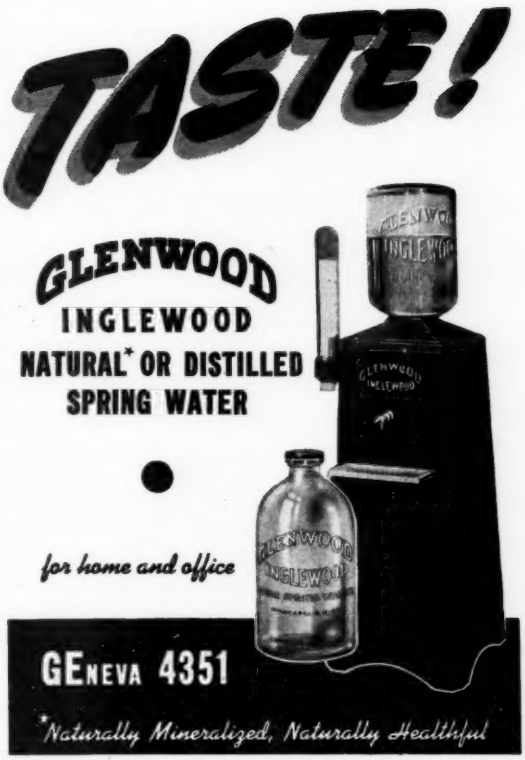
This synopsis of ophthalmology should find an important place in the classrooms and libraries of the junior medical student.

H.J.R.

CLINICAL-PATHOLOGICAL CONFERENCE

(Continued from Page 1110)

48. Stafford, E. S.: Regional ileitis and ulcerative colitis. Bull. Johns Hopkins Hosp., 62:399-407, (April) 1938.
49. Warren, S., and Sommers, S. C.: Cicatrizing enteritis; regional ileitis as a pathologic entity. Am. J. Path., 24:475-497, (May) 1948.
50. Wilensky, A. O.: The essential nature of nonspecific granulomatous lesions of the gastrointestinal tract. Surgery, 6:288-305 and 452-463, (Aug. and Sept.) 1939.
51. Williams, C.: Inflammatory tumors of small intestine. Virginia M. Monthly, 60:728-733, (March) 1934.



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MEDICINE—Intensive Course, two weeks, starting October 11.
Personal Course in Gastroscopy, two weeks, starting November 8.
Gastroenterology, two weeks, starting October 25.
Hematology, one week, starting October 4.

DERMATOLOGY—Formal Course, two weeks, starting October 4.
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Ocular Fundus Diseases, one week, starting November 15.

OTOLARYNGOLOGY—Intensive Course, two weeks, starting October 18.

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Information and application forms may be secured at most first- and second-class post offices, from Civil Service regional offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted in the Commission's Washington office until further notice.

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